Volume 76 Number 9
September 2008

# Amateur Radio

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THE MAGAZINE FOR
AUSTRALIAN
RADIO AMATEURS

## VK3XPD gets serious about 10 GHz

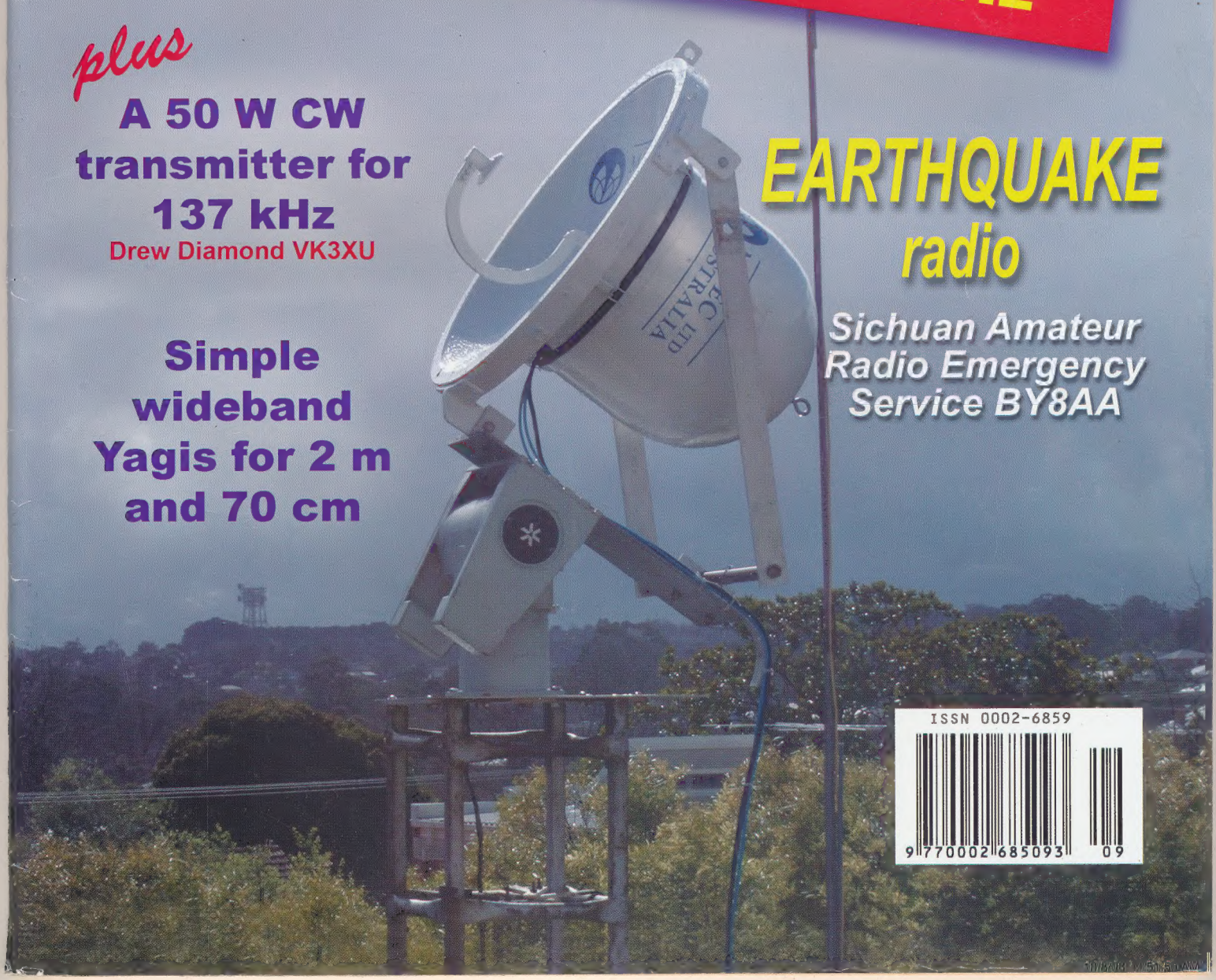
*plus*

**A 50 W CW transmitter for 137 kHz**
Drew Diamond VK3XU

**Simple wideband Yagis for 2 m and 70 cm**

## EARTHQUAKE radio

*Sichuan Amateur Radio Emergency Service BY8AA*



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# Amateur Radio

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## Our Cover this month

**The cover photo this month shows the 10 GHz transverter system mounted at the antenna at the home of Alan Devlin VK3XPD. Located in Burwood in Melbourne's eastern suburbs, Alan is ready to explore just what may be possible using the 10 GHz band. Also look at the inside back cover for more views of Alan's gear: you can see part of the three metre diameter dish that Alan uses for EME operation, and part of the internal workings of the transverter mounted in the radome behind the small dish that features on the cover. Photographs by Alan Devlin VK3XPD.**

### Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, 'How to write for Amateur Radio' is available from the National Office on receipt of a stamped self-addressed envelope.

### Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $8.00 each (including postage within Australia) to members.

### Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

### Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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The world's first and oldest National Radio Society
Founded 1910

Representing
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***Member of the***
***International Amateur Radio Union***

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# Editorial Comment

## Spring is almost here

As you read this, spring has officially arrived. It is hard to believe here in Churchill, after more than a week of very cold and wet weather blowing up from the Southern Ocean. I am really not complaining: we can certainly do with lots more rain, provided it arrives in only moderate quantities on each occasion.

With September comes the equinox and the chance of extended propagation on the VHF bands via various ionospheric modes. "Magic Band" aficionados will be listening as much as possible, intent on catching any opportunity that may arise.

## Contests and activations

The Remembrance Day Contest is happening as I write, as is the International Lighthouse/Lightship Weekend. Coming up is the ALARA Contest. Yes it is fun to just participate in a Contest (or an event such as the ILLW). But do send in your log, especially for the RD Contest – every point counts for your home state.

## The Shack in Winter

Many have been tackling various projects on the cold winter days. The weather has not been good here in Victoria for antenna projects or outdoor tasks. Many will have taken the opportunity to tackle indoor construction projects, as evidenced by at least a couple of VHF amateurs in this issue.

Well known microwave operator Alan Devlin VK3XPD shows us what can be done in repurposing ex-commercial equipment – just look at the cover and inside back cover! Having previously operated 10 and 5.7 GHz EME (Earth-Moon-Earth) from his house in Burwood, Alan has recently commissioned a 10 GHz transverter system for terrestrial operations. With the local oscillator chain referenced to a GPS locked 10 MHz oscillator, Alan will have overcome one of the key potential stumbling blocks for microwave operations – am I on frequency? It is common for errors of several to tens of kilohertz to be observed in transverter systems. And that is just with your equipment. Add the same uncertainty to the contact station, together with antenna pointing requirements, and sometimes you may not make contact, even with care by both operators. Having solved this, at least at his location, Alan has mounted the transverter system almost at the feedpoint of the dish antenna (just behind the dish). But he has also mounted the dish on a fully steerable azimuth-elevation mount. How long will it be until we see some long distance rainscatter or troposcatter contacts?

The VHF/UHF column shows some brief reports of experiments between Rex VK7MO in Hobart and Rhett VK3VHF at Bairnsdale. Both now run their IC-910 transceivers with the master oscillators locked to a GPS reference. The increased accuracy of the operating frequencies means that these operators can begin to explore new limits of station performance and propagation, as evidenced by the recording displayed in this month's column. I am sure that many more weak-signal VHF and UHF operators will be moving toward similar schemes, especially following the discussion of this topic at GippsTech back in July.

As more operators explore the possibilities of digital modulation and demodulation schemes, one can only wonder how long it will be before the major equipment manufacturers include a 10 MHz reference input/output port on all their transceivers? Icom has provided such a port on the IC-7700, reviewed last month. How about the IC-910H, the IC-7000, and equivalent radios from the other manufacturers? Not every amateur will demand such performance for everyday operation, but many are already exploring how to modify their equipment so that it meets their needs.

## More spring

September: football finals, soccer season starting, the end of the VK snow season. Your last opportunity to work the special Olympic stations in China. Time to prepare for coming contests. Then it is not too far until Christmas – where did those last few months go?

Get ready for the improving weather and hopefully improving propagation on HF – surely it must come soon?

73,

**Peter VK3KAI ar**

**Michael Owen VK3KI**
President WIA

## WIA Membership

In the period following the restructure of the WIA on 16 May 2004 it was hard to identify who were members, because of the transitional arrangements.

Before that, "members" were members of a "Division" of the WIA. There were seven Divisions, one from each of the six states and the seventh from the ACT. Each Division was a company of one kind or another. The South Australian Division was really the Wireless Institute of Australia SA & NT Division Inc.

Each of the Divisions was a member of The Wireless Institute of Australia, which was then the federal company. So, then the company had only seven members.

Individuals were members of a Division, each governed by its own "Council".

After the restructure, which was really the adoption of a new constitution by the representatives of the Divisions, replacing the then existing Constitution (but then called the Memorandum of Association and Articles of Association) individuals could become members of the WIA.

The Divisions from South Australia and the Northern Territory, Queensland, Tasmania and Western Australia were wound up, transferring all or some of their assets to the WIA and entering into a series of agreements with the WIA.

Three of the previous Divisions continued, no longer as a part of the WIA but as affiliated radio clubs.

The ACT Division became the Canberra Region Amateur Radio Club. The New South Wales and the Victorian Divisions also continued as radio clubs, Amateur Radio New South Wales and Amateur Radio Victoria.

The WIA is very reliant on the clubs, as the many clubs across Australia provide the local social meeting point and, importantly, the attractive focus for potential amateurs.

It is the clubs that can promote amateur radio in a local area, can provide the training and it is from the clubs that the Assessors and Learning Facilitators come, the people who conduct the assessments of potential amateurs within the examination framework of the WIA.

That is why the WIA has encouraged club membership. We believe that most amateurs should be a member of the WIA and a member of a club. Everyone can decide for themselves which club suits them, which club has the people, the social activities, the interesting meetings and other activities and is conveniently located.

The WIA supports the clubs by making available facilities for the clubs on the WIA website, arranging public liability insurance at attractive premiums and making available grants under the club grant scheme.

In the period following the restructure, members of a Division were "provisional" members of the WIA, and when their Divisional membership ran out, they were able to become full members of the WIA.

That is why I said that it was hard to identify who were members of the WIA.

But after that it became a lot easier, and the WIA has enjoyed a very steady increase in membership. Steady, but not as fast as some would have liked.

Thanks to the introduction of the Foundation licence in October 2005, there has also been a steady increase in the number of amateurs in this country.

Now, for the first time, there has been a very small drop in the number of members. In many ways, and this is one of them, things are "quiet".

I believe this is very much a product of the current economic climate. Many people are being at least cautious, with fuel and food now much more expensive than only a year ago.

But the role of the WIA goes on. The preparatory activities for the ITU's next World Radiocommunication Conference have started, work continues on the issues being looked at by the ACMA, including the 400 MHz band, amateur examinations continue, and the WIA continues to manage the examination system.

The broadcasts go to air every week, the magazine continues to be published, and work continues on the next edition of the Call Book.

I know that a few people believe (or, at least, say) that the WIA is a very wealthy organisation, and that it makes unreasonable profit from its activities such as examination management. If only that was the truth. In fact, the reverse is the truth. If anything, membership subscriptions are subsidising the cost of exam packs.

On the restructure, back four years ago, the new WIA membership subscription was set low, as a part of the transition process. The subscriptions have stayed low. One reason why subscriptions have been able to remain low is that interest from the WIA's reserves has, in effect, subsidised membership subscriptions.

But that is a very short run solution.

The WIA faces a dilemma. I have no doubt our subscriptions are less than they should be, particularly if we are to maintain our services.

If we had more members, then we would not need to increase subscriptions. But if we increase subscriptions, would our membership drop further?

I started by talking about the clubs. We look to the clubs to encourage WIA membership. We also look to you, the members to encourage others to become WIA members.

And, please, do not forget to renew your membership.

It is never too late to do that.

**ar**

# WIA News

## Arrangements for callsigns after the ballot

On 7 February 2008, ACMA announced that it would seek to implement contractual arrangements with the WIA for the provision of certain services, including the management of amateur examinations, the issue of certificates of proficiency and certain administrative functions, including the ongoing management of callsigns.

ACMA and the WIA are in the process of formalising the contractual arrangements. Subject to the outcome of these negotiations, it is expected that the WIA will be managing callsigns following the Ballot process – most likely to commence at or shortly after 24 October 2008.

At this stage, it is expected that callsigns (including two letter callsigns) will be treated by the WIA in the same way they were treated prior to October 2005 (that is, they will be available on a "first come, first served" basis).

Neither the WIA nor ACMA is in a position to accept any applications for two letter callsigns at this time.

Further announcements will be made before 24 October.

## Ballot for two letter callsigns

On 1 August 2008 the WIA placed details of the ballot for two letter callsigns, a list of the available callsigns and the necessary downloadable application form on its website. The WIA is conducting the ballot on behalf of ACMA.

In the first few days, the WIA published answers to various questions on its website.

Here is a summary of those questions and answers.

The fee of $59.74 is a fee to enter the ballot and represents the costs that the WIA is likely to incur for its conduct and is therefore non refundable in the event of an applicant not being successful.

The other question was could someone who was prepared to meet the fee in each case put in multiple entries for the ballot. The answer is no.

Can clubs participate? The answer is "no".

Can I have more than one three letter callsign and participate? The answer to that is "yes".

If someone succeeds in the ballot, can they keep their current callsign and have the two letter callsign as an additional callsign? The answer is "no".

If someone who has more than one three letter callsign is successful in the ballot, we expect that person to vary the licence for their primary callsign, that is, the callsign for the state or territory where they are resident and which they ordinarily use.

What about two letter callsigns that become available in the time between the list of available callsigns on the WIA website was prepared and the close of the applications to participate in the ballot on 29 August 2008? Any two letter callsigns that becomes available after the list of available callsigns was compiled will remain quarantined until the whole ballot process has been completed on 24 October 2008.

Before the first two weeks of August had passed, more than 600 forms had been down loaded and more than 150 applications had been received.

By the time this issue of AR is distributed, the ballot will have closed.

## WIA Club Grant Scheme

On 28 July 2008 applications for grants under the WIA's Club Grant Scheme closed.

This year, the Board increased the total Grants to $6,000 and the Scheme was broken into two sections, one part providing for up to three grants of up to a total of $3,000 for useful but not innovative projects or activities, including projects involving repeaters or associated links. The other part will be for projects or activities that are innovative, with provision for up to three grants up to a total of $3,000.

15 applications for Grants were received from clubs across Australia.

## WIA at Northern Corridor Hamfest

The Northern Corridor Radio Group held their annual Hamfest on Sunday 3 August.

The WIA was happy to be involved with the NCARG, and attended the Hamfest with a table manned by WIA Director Eddie Saunders VK6ZSE, with assistance provided by Keith Bainbridge VK6XH and Neil Husk VK6BDO.

A number of people took WIA membership application forms, promising to return them to the WIA office.

## WIA at Gippsland Gate Hamfest

On Saturday 19 July 2008 the Gippsland Gate Amateur Radio Club held its annual Hamfest at the Cranbourne Public Hall, Cranbourne.

The WIA was represented by directors Peter Young VK3MV and Robert Broomhead VK3KRB and Diane Ashton VK3FDIZ from the WIA office.

**ar**

## Submission of Articles

Articles submitted for publication in Amateur Radio are accepted on the understanding that:

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# A 50 W CW transmitter for 137 kHz

Drew Diamond VK3XU

**At the time of writing, there is a real possibility of our gaining access in the near future to an LF band near 2200 metres, 135.7 to 137.8 kHz. Offered here are plans for a small CW transmitter for that band, based largely on previous models for 1.8 MHz and 507 kHz.**

Output power is adjustable between 0 and nominally 50 W into 50 ohms. Harmonics are measured at greater than 50 dB below fundamental. Frequency range is from 135 to about 141 kHz. The robust class-E power amplifier can withstand extreme load mis-match (including accidental short or open-circuit load) for reasonable periods without damage.

## Circuit

So that the VFO may run continuously, and thus dodge any warm-up drift between "overs", the oscillator operates at 32 times the output frequency, 4.32 to about 4.5 MHz. Therefore, the VFO signal cannot be heard on the operating frequency during receive periods. This frequency was chosen simply because it employs reasonably dimensioned oscillator tank components for a physically small, yet very stable, VFO assembly.

Output from the 2N5484 VFO buffer (Fig 1) is applied to the clock input pin 10 of a 74HC4040 modulo-2 divider chip, where the divide by 32 output appears at pin 3. The diode clamp at pin 10 moves the 6 V p-p sine signal (from the buffer) fully into the positive region, thus driving the '4040 without need of a Schmitt trigger. The divider must wait for a low at the (R)eset input, pin 11, in order to output a 137 kHz square-wave at pin 3.

An NE555 timer chip performs the transmit timing function. On key closure, the low presented to the (T)rig input, pin 2 of the '555 causes a high to output at pin 3, which is applied to the base of a 2N2222 (to invert the high to low required to enable the divider) at pin 11 of the '4040.

Key activity is also applied to the base of a 2N3638 keying transistor. When base current flows via key closure to ground, +6 V is supplied to the PA bias pot (which also functions as power output control) and the 74HC04 driver chip, 5 gates of which are paralleled to supply sufficient drive to the gate of the PA MOSFET. A 220 nF capacitor between base and collector of the '3638 provides a nicely shaped ramp of about 3 ms rise and 10 ms fall for clean, click-free keying.

Directly keying (sending) stops, and between words and some characters, the '555 timer will "time-out", and allow reception (on a separate antenna - see "Operation" below).

The class-E PA and low-pass filter (Reference 6) are evolved from those used in previous models for 1.8 MHz and 507 kHz. Efficiency for the prototype is about 75%, where 65 V dc @ 1 A produces 50 W RF output (the lesser efficiency than the 1.8 MHz model is attributed to the higher copper losses in the rather large 'fly-back' coil (yes, I did try Litz wire, among other things - same result). The curious are pointed to References 1 to 4 for a description of class-E operation.

Do also explore Lloyd Butler's (VK5BR) excellent Web site (Reference 5) for further contemporary practical information on building LF transmitters, receivers, and lots more.

## Construction

The homemade aluminium chassis/cabinet pictured in Photo 1 measures 70 x 265 x 230 mm HWD. The bottom chassis panel functions as a heat-sink for the BUZ90A PA MOSFET (very little waste heat is generated).

The power supply, VFO, and driver/PA are each accommodated upon "paddyboard" (Reference 7) circuit boards. Suggested layouts are shown in Fig 2. However, any preferred construction style will serve, provided that signal carrying component leads (eg coupling and by-pass capacitors, etc) are reasonably short, and the general plan pictured in Photo 2 is followed.

A rectangular hole of 12 x 18 mm should be provided in the RF board so that the BUZ90A may be attached to the bottom panel - include a silicone washer and the usual hardware. A solder tag is mounted under the 3 mm hex fixing nut for the drain connection.

Photo 1: The 137 kHz Class-E 50 W CW transmitter.

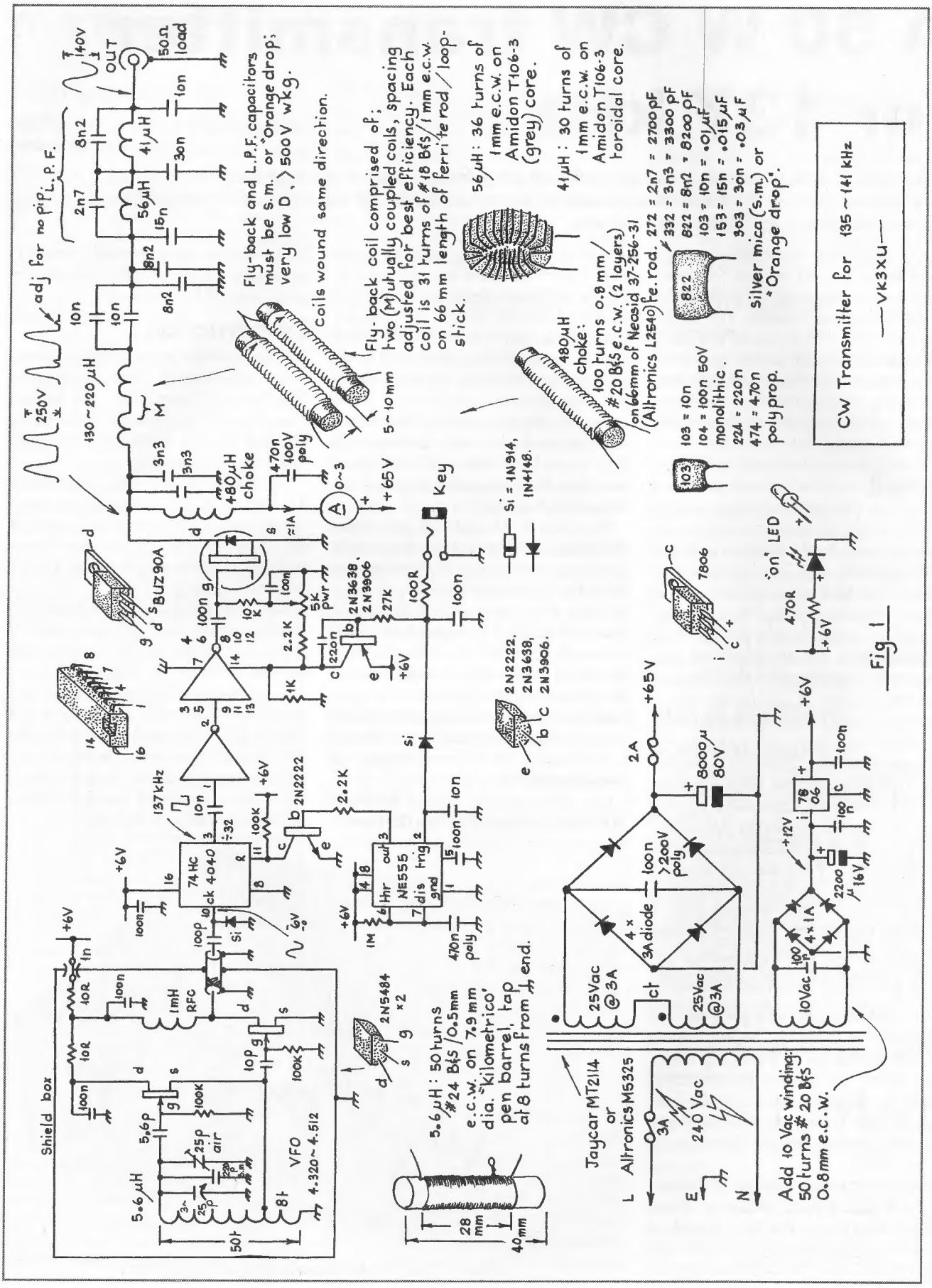


Figure 1: Schematic of the 50 W CW transmitter for 137 kHz

The 74HC4040 and 74HC04 chips may be fitted into appropriate IC sockets which, in turn, are soldered to suitably sized pieces of Vero board. Remember first to cut a shallow slot (junior hack-saw) along their length to separate the pins each side of the "substrate". Do not poke the socket pins right through (so as not to short to board foil). These are super-glued (sparingly - absolutely no glue on items that must take solder) upon the RF circuit board as shown.

Or consider using hot-melt glue. Place a small sliver (in solid form) upon the underside (fibre) of your pad or substrate, and then melt it evenly with the tip of a soldering iron. When the glue is liquid, quickly stick the pad on to the main board in the exact spot required.

The NE 555 timer chip may be installed in an 8-pin socket that is in turn soldered upon a suitably sized substrate, copper side up, as shown in Fig 2. The angled cuts (modellers' mitre box) are made at 65 degrees to the centre line.

The drain choke coil is 100 turns of 0.8 mm (#20 B&S) ecw wound as two layers upon a 66 mm (approximately, which is 1/3rd of a) length of Neosid (Altronics) 9.5 mm diameter 200 mm long ferrite rod/loop-stick material. The start and finish of the winding may be secured with a plastic cable-tie fitted over the coil.

As a simple means of adjusting the fly-back circuit, the series coil is comprised of two mutually-coupled 60 µH solenoids wound upon loop-stick material. By altering the spacing between these, their combined inductance is variable from about 130 µH to 220 µH, thus allowing the fly-back circuit to be "fine-tuned" for best efficiency.

The coils each comprise 31 turns of 1 mm (#18 B&S) ecw wound upon 66 mm lengths (the remaining 1/3rds) of 9.5 mm loop-stick rod. Note that they must wind in the same direction. Again, their ends may be secured with cable-ties.

The VFO and buffer should be accommodated in an RF tight box measuring 50 x 50 x 80 mm HWD made from soldered-together single-sided circuit board, as shown in Photo 3. A 3 mm brass nut may be soldered into each corner for affixing the lid. Brass or bronze shim metal "fingers" should be soldered to the box walls in four places to ensure reliable electrical contact with the lid. Drill a suitably sized hole in the lid to admit a plastic trimmer adjusting tool.

The variable capacitor may be any well-made part with a range about 3 - 25 pF (see Parts below). Ordinary "ugly" construction is quite suited to oscillator work and, provided that lead

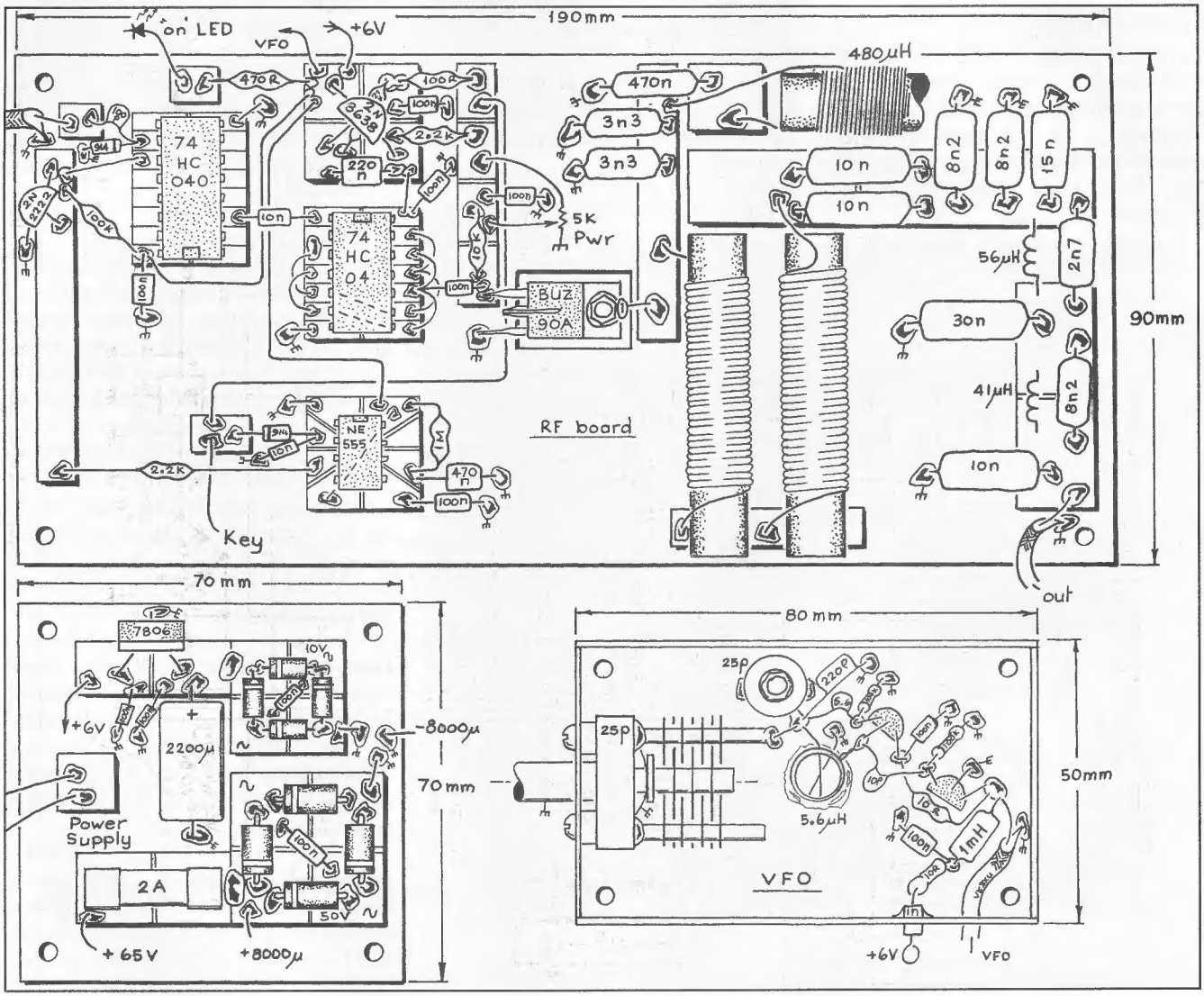


Figure 2: Layout of the components on the "paddyboards" and in the VFO enclosure.

lengths are short and components are mounted rigidly, your oscillator should be remarkably stable.

The VFO coil is 50 turns of 0.5 mm (#24 B&S) ecw wound firmly upon a 40 mm length of common 7.9 mm diameter "Kilometrico" pen barrel. This material is easy to work and has been found, in numerous examples, to provide good mechanical stability and low loss for oscillator coil applications. Drill a 1 mm hole in two places across the former's diameter, as shown in Fig 1. The source tap (a twisted "pig-tail") is at 8 turns from the "earthy" end. The coil may be fixed to the VFO board with a blob of hot-melt glue.

All wiring on the 240 V ac mains side of the transformer MUST be suitably covered to prevent accidental contact. Include a 4 A "slow-blow" fuse in the line side.

## Operation

Carefully inspect your wiring and soldering for quality, accuracy, and absence of solder "bridges" (between Vero tracks). Double check for correct polarity of all polarised devices, e.g. ICs, electrolytics, diodes, regulators, transistors, FETs, etc.

It would be shrewd to first verify the supply rails. Remove the 2 A PA fuse from the power supply board. Apply mains power and check that you have (about) +65 (70 V dc no-load) and +6 V dc where indicated.

If an oscilloscope is available, close the key and observe (with a x10 probe) the signal at the gate of the BUZ90A. You should see a ~137 kHz square-wave of about 6 V p-p. Some salient signal waveforms are shown on the circuit to aid in any necessary trouble-shooting. With the VFO cover in place, adjust the 25 pF trimmer so that 135 kHz is generated with the variable cap at full mesh, and about 141 kHz at minimum mesh.

Replace the 2 A fuse. Connect a suitably rated 50 ohm dummy load/power meter to the output. (Confirm that your power meter will work down to 137 kHz. The current meter part of the recently outlined twin-meter SWR/current meter reads about 20 % low so, at 50 W, you should read about 0.8 A. The SWR meter, being a relative indicator, reads normally). Set the 5 k "Pwr" potentiometer to about half travel. Close the key, whereupon drain current (ID) should rise, and some power output should be indicated.

Hook the 'scope x10 probe to the drain of the BUZ90A. Turn the Pwr potentiometer fully clockwise. You should see a pulse waveform with a p-p amplitude of about 250 V. Adjust the fly-back coil inductance by moving the coils together (better efficiency) or further apart (more power) until the smaller "pip" on the right side of the main pulse is reduced to a flat-line. The voltages are not dangerous but, as you can receive an RF "bite" from the fly-back components, take care. Drain current should be about 1 A at 50 W output.

Now hook your x10 oscilloscope probe to the output connector. With the 'scope time-base at (say) 1 µs/division, observe a clean sine-wave output signal.

Verify CW keying. Set the 'scope for ~10 ms/div and observe a nicely ramped keyed wave-shape, free of blips or spikes (you may notice a smidgen of 100 Hz ripple which is quite acceptable).

In the opinion of this writer, it is not recommended that the main transmitting antenna be used on receive. Rather, better results will probably be obtained where a receiving loop is employed (Reference 8). It is hoped to address this application in a future article.

You will find much of interest concerning LF/MF antennas and propagation on VK3ACA's Web site (Reference 9).

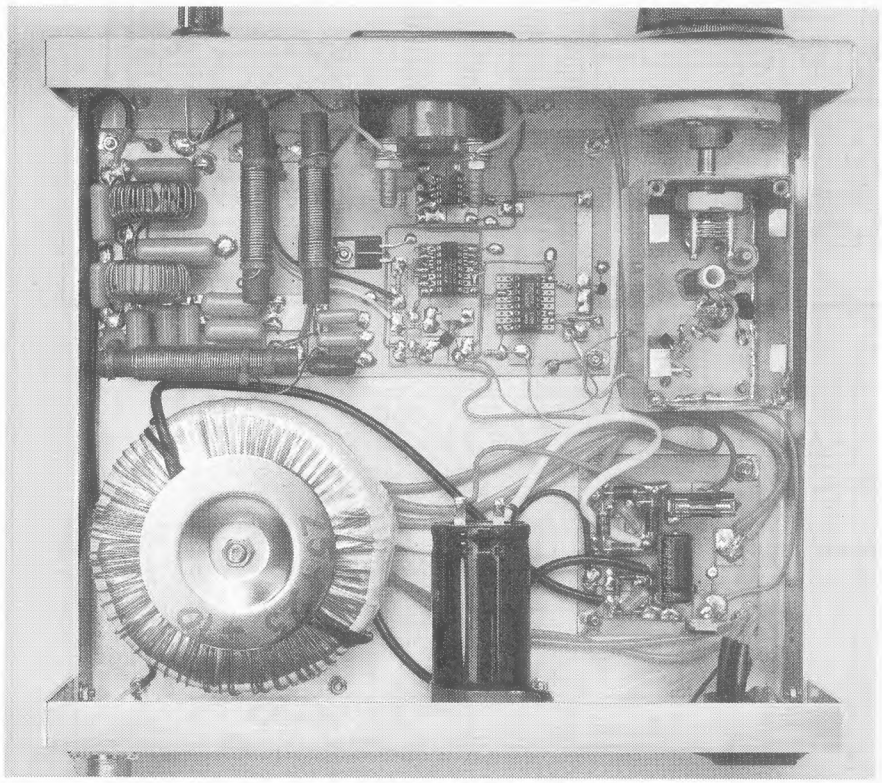

Photo 2: View inside the transmitter with the cover and VFO lid removed.

## Parts

All the ordinary components are available from our usual electronics suppliers, including Altronics, Electronic World and Jaycar. The mains transformer should have a secondary of 50 Vac (two series 25 Vac windings) @ 3.2 A, such as a Jaycar MT 2114 or Altronics M 5325. The 74HC4040 is known to be available from Electronic World (03 9726 3860).

Capacitors marked "10 n" and "100 n" are 50 V monolithic types, except for that across the 50 V rectifier bridge, which should be a 100 n/200 V polypropylene. For good frequency stability, the 220 pF VFO capacitor marked "s.m." (silver mica) should be a >100V silver mica type. For best efficiency, all capacitors in the fly-back and low pass filter should be "s.m." (if you have them) or low-loss "Orange Drop" capacitors. These may be ordered from Antique Electronic Supply (www.tubesandmore.com).

A single length of Neosid 37-256-31 ferrite rod (Altronics L-2540), when divided into three equal pieces, supplies enough material for the job. To cut the rod to length, grind a shallow groove around the circumference, then grip the rod with thumbs each side of the groove,

and snap it, as you would break a stick.

Siemens BUZ90A MOSFETs (P/N 12329) may be purchased from Rockby Electronics (http://www.rockby.com.au). Rockby also stock some values of silver mica capacitors.

Amidon T106-2 toroids may be ordered from any of the suppliers regularly listed in the Hamads of *Amateur Radio*.

The 3 - 25 pF variable capacitor for the VFO must be first-class. An English Jackson Bros or "Polar" would be ideal. The trim capacitor should be an air dielectric type, such as a 25 or 30 pF Philips "beehive" (I am not in the parts business, but do please contact me by 'phone [03 9722 1620] or letter if you cannot locate a suitable variable capacitor, or are held up on one or two other items).

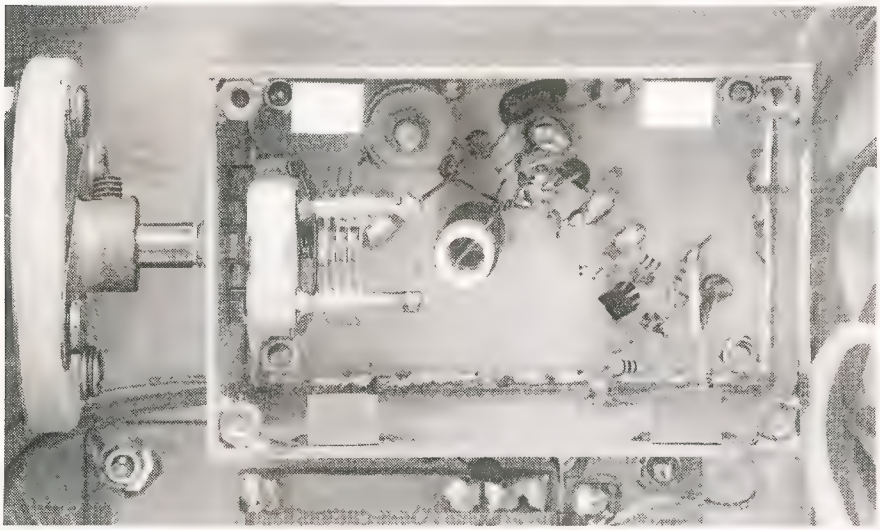

Photo 3: The VFO assembly.

## References and Further Reading


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3. Experimental Methods in RF Design; W Hayward et al; ARRL, pp 2.31, 2.32.
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9. http://member.melbpc.org.au/~jadcock/


**Photos: Karlen Dockrey**

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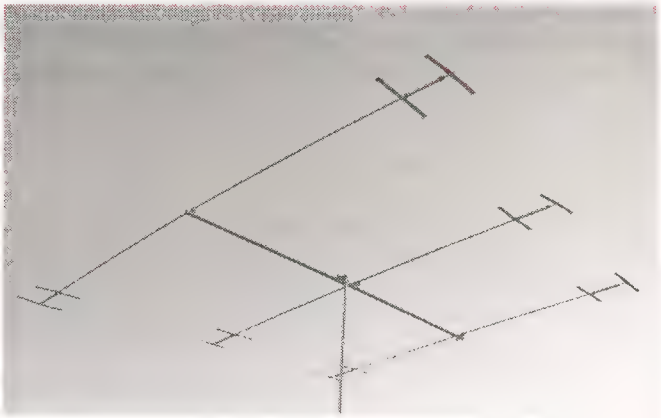

SPECIFICATIONS

| | |
|---|---|
| FREQUENCY | 14, 21, 28 MHz BAND |
| MAX.ELEMENT LENGTH | 5520 mm |
| BOOM LENGTH | 4.0 m |
| GAIN | 6 / 6 / 7 dBi |
| FRONT TO BACK RATIO | 20/ 15/ 14 dB |
| FEED IMPEDANCE | 50 ohm |
| TURNING RADIUS | 3.74 m |
| WEIGHT | 12 kg |
| POWER RATING | 2 kW PEP |

*ALL 6000 SERIES ALUMINIUM CONSTRUCTION.
*ALL STAINLESS STEEL HARDWARE.
*2 kW PEP POWER RATING.
*3.74 METRE TURNING RADIUS.

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If you already have a TE-23M, you can purchase the extension kit containing extra boom, director element, and everything you need to upgrade to this antenna..

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# Simple wideband Yagis for 2 m and 70 cm

Paul McMahon VK3DIP

**I recently had the need to build a couple of new antennas and they worked out so well I thought I should share the details. The two Yagis described here are simple to make, use readily available materials, have no tuning or matching requirements, and work well across the entire 2 m and 70 cm bands respectively.**

The description here covers some background and theoretical analysis of the two Yagis as well as the construction details.

## Designing Wideband Yagis with Yagicad

Some 16 years ago I wrote and started distributing, via shareware, a computer programme to analyse and design Yagi antennas called Yagicad (Reference 1). Over the years this programme has seen many changes from the early DOS versions to the most recent Windows version 5.2.

I have long since given up trying to make money from this program and for some years it has been free to download and use, with features added basically as I myself needed them for whatever I was doing at the time, and as ever-increasing computing power made them practical. Version 5.2 came about because I wanted some wideband antennas to minimise tuning and matching problems so I added the ability to do multi-frequency, multi-parameter optimisation. For obvious reasons, this discussion will focus on doing this with Yagicad, but of course other packages should give equivalent results.

The approach I took when designing these two antennas was to first work out roughly what I wanted and in my case this worked out to be:

Simple matching across the band - while programs like Yagicad help to calculate gamma and other matches these are often problematic in terms of physical and multi-frequency aspects. Ideally this would be a straight connection directly to the driven element.

- Modest but uniform gain across the band.
- Uniform pattern across the band.
- Simple construction with bits that could be bought as cheaply as possible mostly at the local hardware store.
- Could fit both 70 cm and 2 m on the one small rotator.
- As immune as possible to environment and bird damage.

Putting a number of these things together I came up with an approximate boom length of 1.5 metres as being something that would fit comfortably on the rotator, give reasonable gain, and not offer seating to too many birds. Similarly sticking with a non conductive boom simplifies the whole process and maximises the accuracy of the models used.

Once I had the approximate boom length I loaded the 20 element DL6WU-designed long Yagi into Yagicad, scaled it to the centre frequency and element diameter size I wanted, and deleted elements until I had something of roughly the correct boom length.

I used the DL6WU as a base because as many know this design has stood the test of time and is pretty much the benchmark for gain and reasonable input impedance. This design also readily lends itself to just adding, or as in this case, subtracting, elements with the resultant Yagi being still pretty close to optimum. This worked out to be five elements at 2 meters and eight at 70 centimetres.

Both of these cut down designs showed reasonable performance in terms of gain and input impedance, at least for the band mid points, however as I wanted something that was pretty much constant across the whole of the bands for both gain and input impedance this is where the genetic optimisation comes in.

Mentioning genetics and antennas in the one sentence may seem a bit strange to many people, but using genetic algorithms to optimise all sorts of things from antennas to engines is now pretty commonplace. A full description on how genetic algorithms work is beyond the scope of this article, suffice to say the method as used in Yagicad generates a large population of random Yagis, evaluates this population for relative fitness, breeds the most fit with each other to create the next generation and so on until some sort of end point is reached.

This method works really well with antennas like Yagis where there are a very large range of possible configurations, and where it is desired to optimise multiple parameters at the same time. The only downside is, as can be imagined, it needs a PC with a fair amount of grunt to do it in realistic times.

The resultant antennas obtained from this process after expending quite a bit of PC time in Yagicad are detailed in the following sections. In general however the designs have approximately the same gain figure as the starting point cut down DL6WU design, but with that gain effectively constant across the entire band, similarly the input impedance is shown as very close to 50 Ohms, again flat across the band. The patterns are fairly uniform also with most side-lobes and front-to-back over 20 dB down.

These designs fall within the class of the so called Optimised Wideband Antenna or OWA, physically characterised by, amongst other things, a close spaced first director. OWA Yagis have been around for quite a while in the HF bands, and people like L. B. Cebik W4RNL (Reference 2) have been doing considerable work to show the applications of this class of Yagis in the VHF and UHF bands. The designs here have ended up being similar in many ways to those of W4RNL; however in this case it is literally "parallel evolution", or if you like simply a validation that these designs

meet the requirements of bandwidth and impedance.

## The 2 m, 5 element design

| ELEMENT NO. | LENGTH | SPACING | DIAM. |
|---|---|---|---|
| 1 | 1.030 | 0.000 | 0.012 |
| 2 | 0.984 | 0.421 | 0.012 |
| 3 | 0.919 | 0.616 | 0.012 |
| 4 | 0.914 | 1.007 | 0.012 |
| 5 | 0.852 | 1.489 | 0.012 |

Table 1: 2m5el OWA.

Note: all dimensions are in metres, with spaces measured from the reflector.

The resultant 2 m, five element design worked out to have just under the 1.5 metre boom length, and at the frequency of 145 MHz had a calculated gain of 8.1 dBd ( ie. dB over a dipole, add 2.15 for dBi). The input impedance at this point came out at 47.93 + 1.46j Ohms. All of these calculations were made using Yagicad with the NEC2 engine set at 33 segments per element.

Performance across the band is what I was after, and this can be most readily seen in the 144 to 148 MHz swept and overall plots given in Figures 1 and 2 respectively. In Figure 1 the gain is pretty much a straight line at just over 8 dBd, with front-to-back always over 20 dB, and impedance also pretty constant across the band. The impact of that impedance is seen in Figure 2 with the overall VSWR (for a direct 50 Ohm connection) staying basically flat at under 1.1 to 1 across the band.

The patterns at the band extremes (i.e. 144 and 148 MHz) as shown in Figures 3 and 4 are also pretty similar and free from side-lobes.

This design is included in the Yagicad 5.2 distribution as 5el2MOWA.yag

## The 70 cm, 8 element design.

| ELEMENT NO. | LENGTH | SPACING | DIAM. |
|---|---|---|---|
| 1 | 0.342 | 0.0 | 0.01 |
| 2 | 0.313 | 0.15 | 0.013 |
| 3 | 0.288 | 0.246 | 0.01 |
| 4 | 0.285 | 0.415 | 0.01 |
| 5 | 0.274 | 0.628 | 0.01 |
| 6 | 0.267 | 0.882 | 0.01 |
| 7 | 0.265 | 1.142 | 0.01 |
| 8 | 0.255 | 1.35 | 0.01 |

Table 2: 70 cm 8 el OWA.

Note: all dimensions in metres, with spaces measured from the reflector

The resultant 70 cm, eight element design also worked out to have just under the 1.5 metre boom length, and at the frequency of 435 MHz had a calculated gain of 11.1 dBd ( ie. dB over a dipole, add 2.15 for dBi). The input impedance at this point came out at 49.33 + 1.26j Ohms. Again all of these calculations were made using Yagicad with the NEC2 engine set at 33 segments per element.

The performance across the band is given in the plots in Figures 5 and 6. In Figure 5 the gain is pretty flat at over 11 dBd, with front-to-back again over 20 dB, and impedance also pretty constant across the band. Figure 6 shows the overall VSWR (for a direct 50 Ohm connection) staying basically flat at under 1.1 to 1 across the band.

Again, the patterns at the band extremes as shown in figures 7 and 8 show relatively small variation with a few more lobes than the 2 m version but none that should cause problems as they are all at low levels.

This design is included in the Yagicad 5.2 distribution as 8el70cmOWA.yag

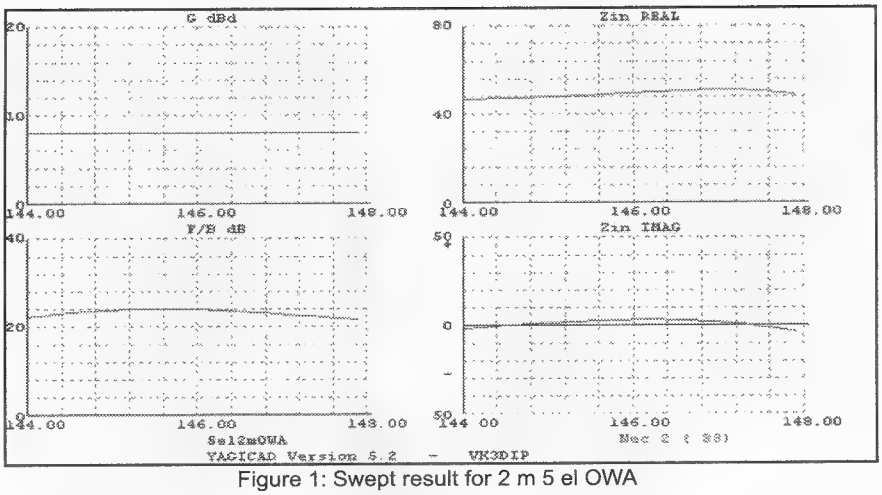


Figure 1: Swept result for 2 m 5 el OWA

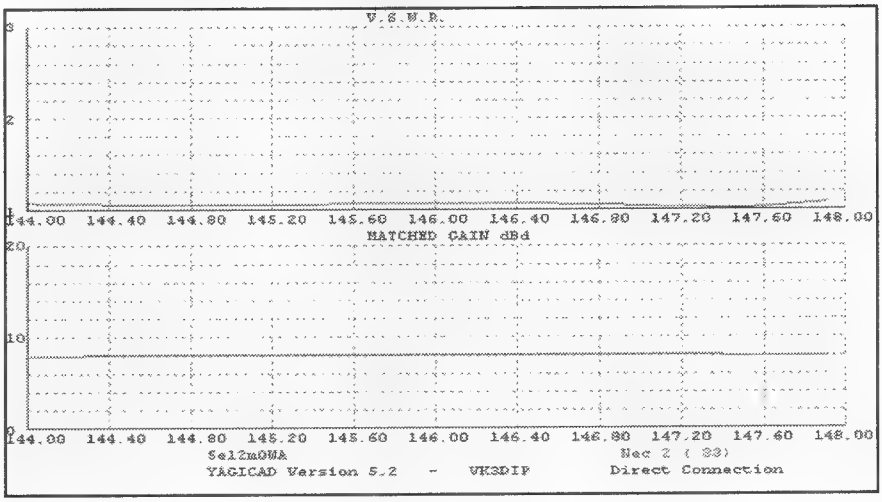


Figure 2: Overall results for 2 m 5 el OWA

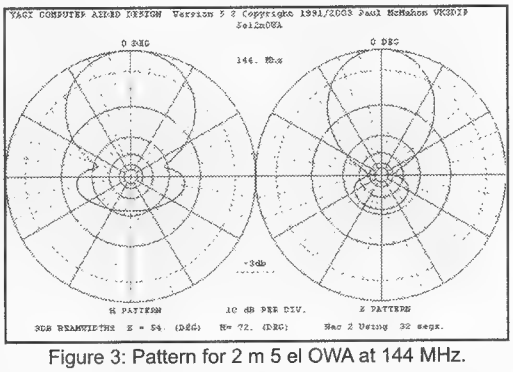


Figure 3: Pattern for 2 m 5 el OWA at 144 MHz.

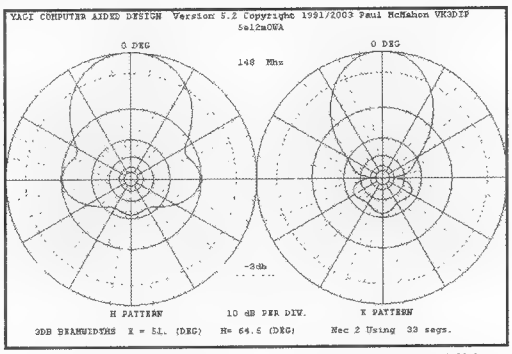


Figure 4. Pattern for 2 m 5 el OWA at 148 MHz.

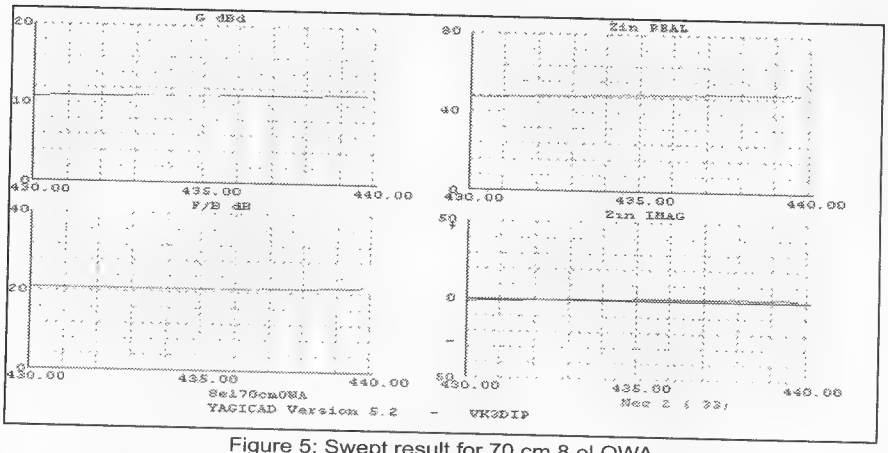


Figure 5: Swept result for 70 cm 8 el OWA

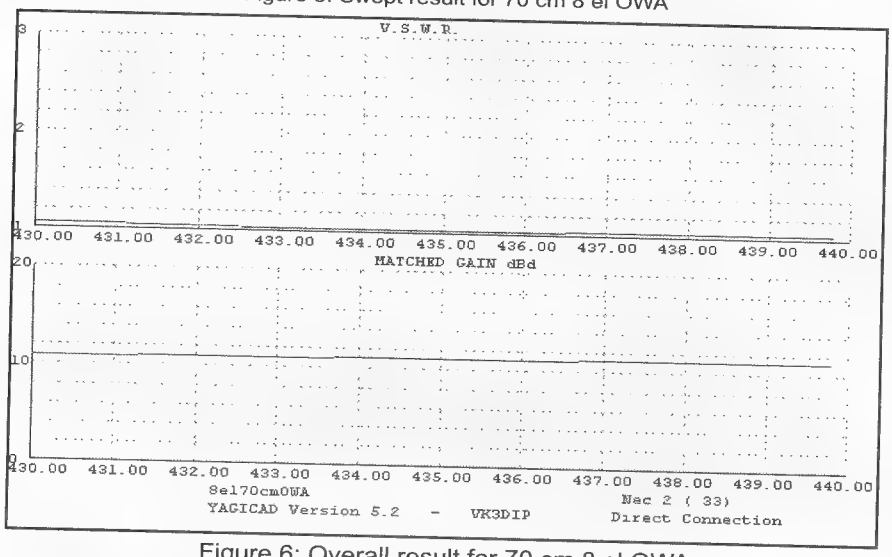


Figure 6: Overall result for 70 cm 8 el OWA

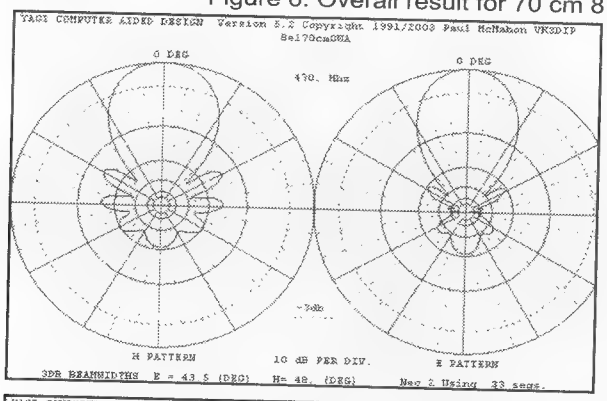


Figure 7: Pattern for 70 cm 8 el OWA at 430 MHz.

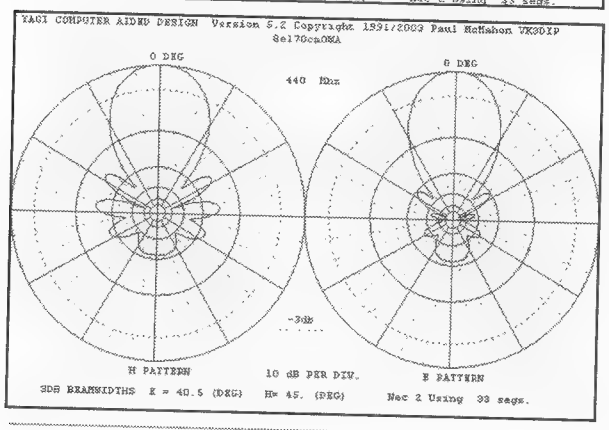


Figure 8: Pattern for 70 cm 8 el OWA at 440 MHz.

## Construction.

Both antennas were constructed using a boom made from 32 mm outer diameter heavy duty "Orange" electrical conduit. I bought a single 4 m length from the local hardware and cut it to suit. Similarly the elements for the 70 cm Yagi came from a single 2 m length of 10 mm aluminium tube, and the 2 m Yagi ones from two 2 m lengths of 12 mm aluminium tube.

In both cases the driven elements came from a single 2 m length of 12.7 mm copper water pipe, stiffened and insulated by segments cut from a 1.5 m length of 10 mm OD fibreglass electric fence support. The problem with copper is that it can be a bit soft and without some sort of support, especially in the 2 m case, it can bend. This is why I used the fibreglass rod to both be an insulator and to support the element.

If the birds are heavy in your area you can stiffen the conduit boom by gluing some 25 mm OD wood dowel inside the conduit before drilling. Remember to either replace the rear section of the dowel from the driven element back with a short section of 25 mm OD conduit, or alternatively mount the balun and coax on the outside of the boom.

The relevant dimensions of the two Yagis are shown in Figures 9, and 10 which are hopefully pretty self explanatory.

The first step is to stiffen the boom if you are doing this. A 25 mm wood dowel fits neatly in the conduit and glue on the dowel as it is 'screwed' in spreads it evenly.

For neatness, weather, and bird, proofing I built the balun and coax connection to the driven element inside the boom. If you are going to do this ensure the dowel only comes up to just before the driven element, coming from the front of the Yagi of course.

The rear section can also be reinforced by using a short length of 25 mm outer diameter conduit, this also makes a nicer fit to the inline coax connector if used. Just about any glue works here; I have used both normal PVA and even silicon sealant.

Before the glue is set it is a good idea to tape the boom to a length of straight timber, say a 1.8 m piece of 20 x 40 mm pine. Taping the boom to the timber helps the boom to set straight, and later when it comes to drilling the holes for the elements, it helps keep them parallel. I

use masking tape as it holds well for this job if you use it in enough places.

The next stage is to mark off the spacing for the elements from the tables and drawings. The boom being taped down makes this easier and if you are making more than one of these antennas, using a piece of wood previously marked and drilled as a template can speed things up. This is then put aside to set/dry.

While the boom is drying the elements can be cut. All the elements except the driven one are cut from aluminium tubing, 10 mm diameter for the 70 cm antenna and 12 mm for the 2 m antenna. As always, measure twice; avoiding having cut the tube only to find that it is now useless because it is the wrong length. File the ends to remove any burs and sharp points, for both safety and to minimise fringing capacitance effects.

For each driven element two pieces of copper pipe should be cut as these two pieces will form the dipole. The drawing has the element half lengths marked (inside the boom) but do not forget we need a 3-4 mm gap in the middle between the halves so the dimensions given allow for that. For example in the 70 cm case the driven element length is 313 mm, but the two sections of copper are only 155 mm long allowing for a 3 mm gap. The other component of the driven element is the 10 mm fibreglass rod. This rod is cut to the exact length of the driven element, e.g. in the 70 cm case this is 313 mm. (Photo 1)

The driven element is assembled by sliding the two halves of 12.7 mm OD copper tube over the fibreglass and fixing in place with some sort of glue. Here the glue should be capable of handling the high temperatures involved in soldering and I find silicon gasket (RTV) works well. The two outer ends of the copper tube should line up with the ends of the fibreglass rod leaving the 3-4 mm gap between the two halves in the middle. Once the glue has set, a crimp with the die for a RG8/213 coax crimp, towards the inner ends of the copper tube, ensures that nothing is going to move.

Once dry you can drill the element holes. Using a drill press helps to keep the holes neat and parallel. Use 10 mm and 12 mm drill bits for the 70 cm and 2 m Yagi respectively, with 12.7 mm

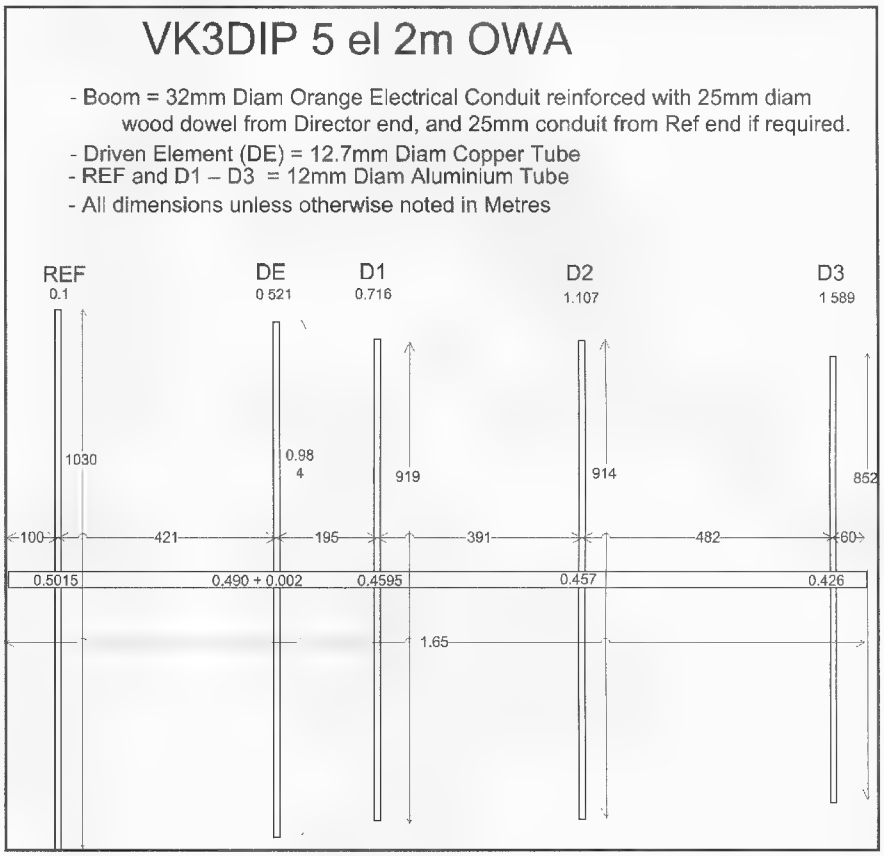


Figure 9: 5el2mOWA Yagi Dimensions

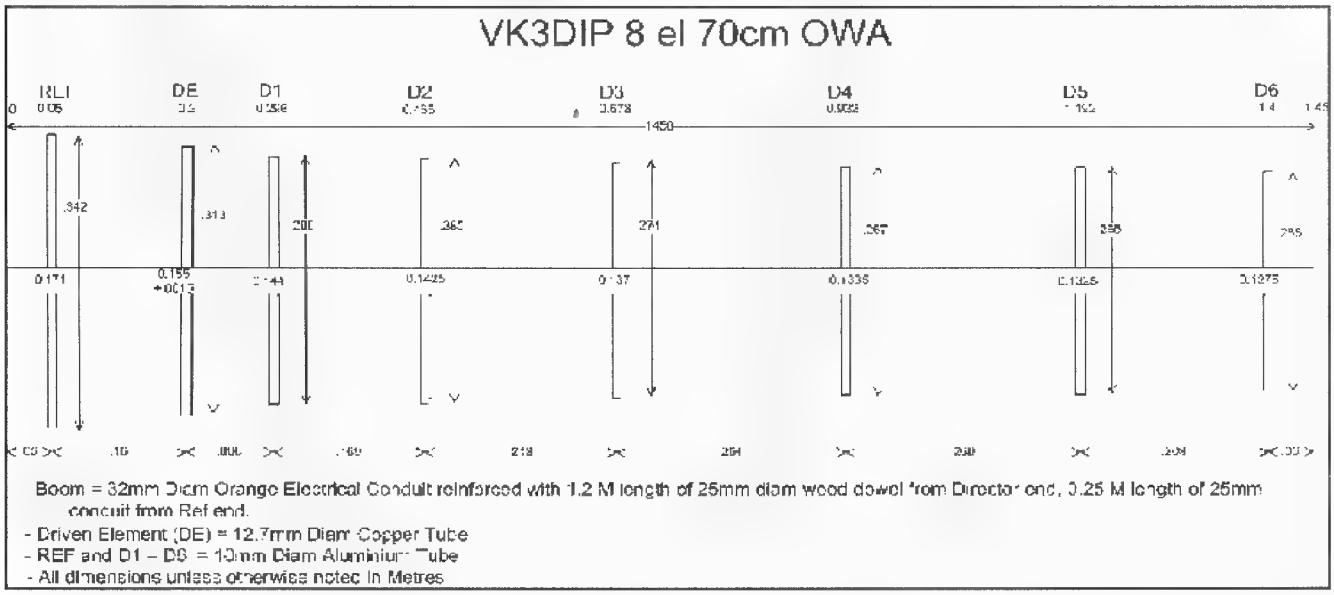


Figure 10: 8el 70cmOWA Yagi Dimensions

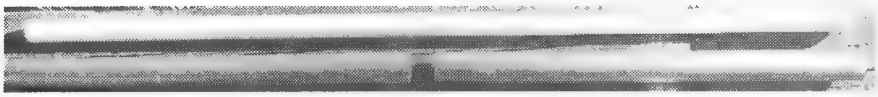

Photo 1: Close up of the 70 cm two driven element halves and the fibreglass support before assembly.

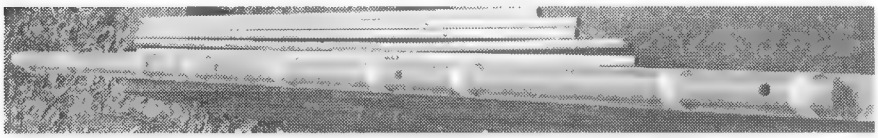

Photo 2: 2 m Boom still taped to wood after drilling, elements cut, driven element assembled.

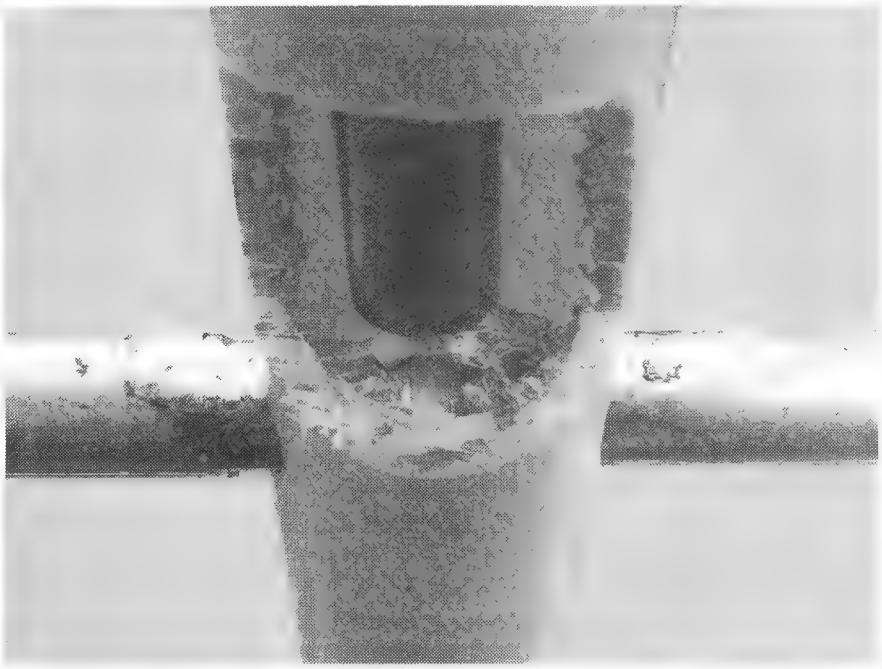

Photo 3: Balun after soldering to the Driven element.

for both driven elements. This point in assembly can be seen in Photo 2.

Before inserting the driven element, the centre of the two halves of copper tube should be solder tinned, the bigger the soldering iron, the better as the copper takes a bit to get it up to temperature.

The directors and the driven element can now be inserted, but not yet the reflector. For securing the directors I found that long reach (1/8 inch diameter (3.3 mm), for securing up to ½ inch (12.7 mm) spacing), aluminium pop rivets worked simplest, cheapest, and not least, best from a corrosion perspective. A 1/8 inch hole is drilled perpendicular through the side of the boom into the element and pop rivet inserted. This can be repeated on the other side if required.

The driven element is held in place by the solder connection of the balun and subsequently a large amount of hot melt glue. You can see the solder connection prior to the glue in Photo 3. Note a small hole has been cut in the boom to facilitate the soldering. I found the simplest way to do this soldering was to apply heat to the copper elements by touching the soldering iron to the copper outside the boom, and then just poking the solder in through the hole which then melted onto the connections, without trying to get the soldering iron itself inside the boom. Once the soldering is done ( and checked) a large amount of hot melt glue can be squirted into the hole to effectively pot the connection protecting it from water and securing the driven element in place. (Photo 3)

In both cases coax connection is made directly to the two halves of the driven element. As my experience with getting good long lasting electrical connection to aluminium is not good, I used copper for the driven element so that the coax/balun can be soldered directly on.

The balun that I used is a simple choke type made using three ferrite sleeve cores threaded on a short length of RG58 or equivalent coax. I used Jaycar part number LF1258 for the ferrite sleeves which seem to work fine.

My tests showed that two cores would do the job, but as they are 6 in a packet I put three on each antenna to be sure. These sleeves with reasonable RG58 coax should have no real problems with the normal sub 100 watt power levels used by most amateurs on these bands.

If you intend to use higher powers you should test after transmitting for a while to see if the ferrite sleeves become warm. If they get too hot (greater than 140 degrees C) the ferrite can lose its properties and will not act as a balun.

Do not feel the cores while transmitting or else they will not be the only thing getting hot. If they are getting too hot just add more cores along the coax to increase the impedance, and thus lower the losses, as well as share out the decreased heat load.

The layout of the balun and connector is shown in Figure 11. In my case I used a female line N connector, but obviously you could use whatever suits your setup, for example just continuing the coax out of the boom and down the mast.

The partially assembled balun for the 70 cm case next to the driven element prior to insertion is shown in Photo 4.

Once the balun is connected and the coax connector (if used) is glued in place, again using hot melt glue or equivalent, the reflector element can be inserted in the boom, ensuring that you notice which side on the element that the coax is passing.

This is very important, if you get the side wrong and then drill the hole for the pop rivet, then you will end up drilling through the coax and destroying the antenna. Obviously in the reflector case you can only pop rivet from one side, the side that does not have the coax.

The completed Yagis are in Photo 5.

## Initial Testing

There are no adjustments anywhere on these Yagis, so they either work or not. My experience with the prototypes is if you are careful with measurements, and soldering, then they work.

Photo 6 shows the result of the prototype 70 cm version being driven at 25 watts at 435 MHz by my TR-851 with the VSWR shown as 1.02 to 1. The measured VSWR at the band edges for the two prototype Yagis versus the values

Photo 4: Balun for 70 cm case.

predicted by Yagicad are shown in Table 3. As can be seen there is remarkably good agreement here. Note: The tests on the prototypes were done at the end of approximately 15 metres of RG213, so the VSWR at the actual antenna would actually have been a little higher than measured but still very good. I have only done very limited on-air tests with the prototypes but indications are that they are working well with good level signals heard throughout the bands.

| Yagi | Frequency (MHz) | Yagicad Prediction VSWR | Prototype Actual Measured VSWR |
|---|---|---|---|
| 5el2MOWA | 144 | 1.074:1 | 1.06:1 |
| | 148 | 1.095:1 | 1.08:1 |
| 8el70cmOWA | 430 | 1.06:1 | 1.08:1 |
| | 435 | 1.029:1 | 1.02:1 |
| | 440 | 1.04:1 | 1.03:1 |

Table 3: Measured VSWR c/f Calculated.

It is early days with these antennas. I will not have them installed in their final positions for some months, nor have I had the chance for on air testing.

Only time out in the weather and exposure to wildlife will tell how robust these Yagis are. Notwithstanding this, all indications are that these Yagis will give me good service for years to come.

## References:


1 Yagicad 5.2 can be freely downloaded from a number of sites including:

http://www.nerg.asn.au/software.htm

and

http://mywebsite.bigpond.net.au/pmvk3dip

2 "Notes on the OWA Yagi" by L. B. Cebik W4RNL, QEX, Jul, 2002, pp. 22-34


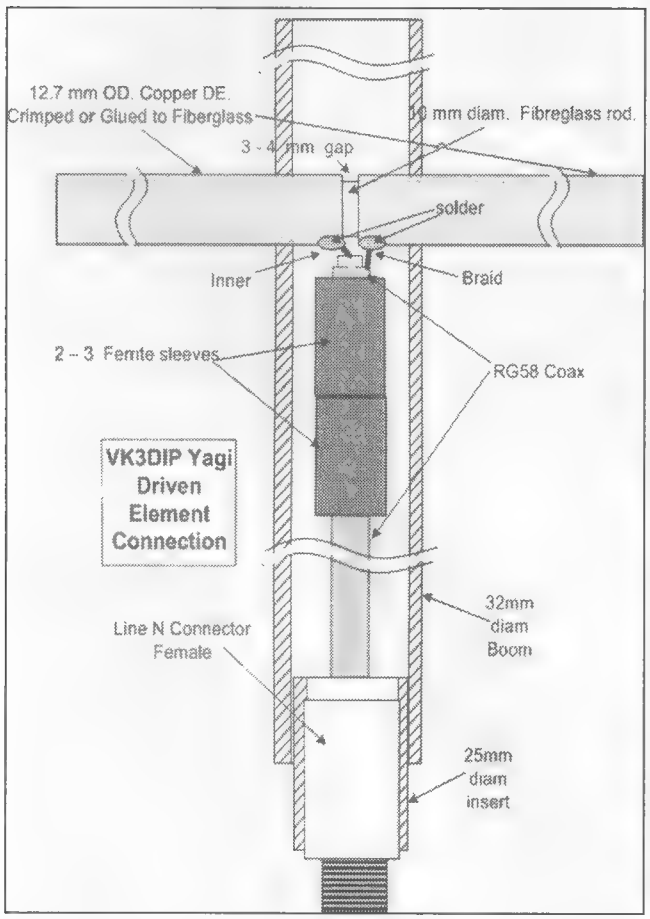


Figure 11: Balun and coax connection to the driven element.

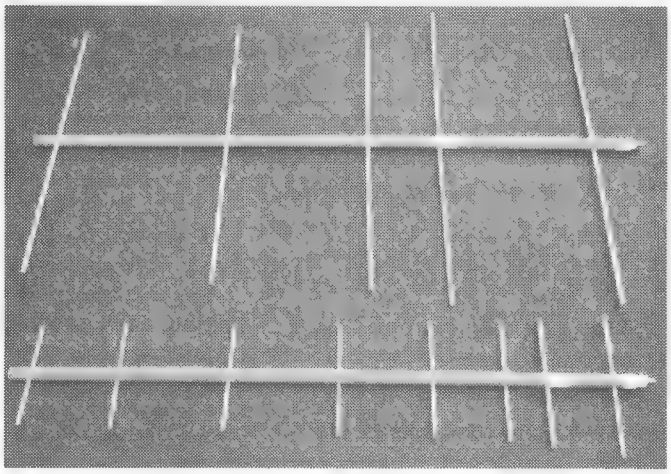

Photo 5: The two completed Yagis.

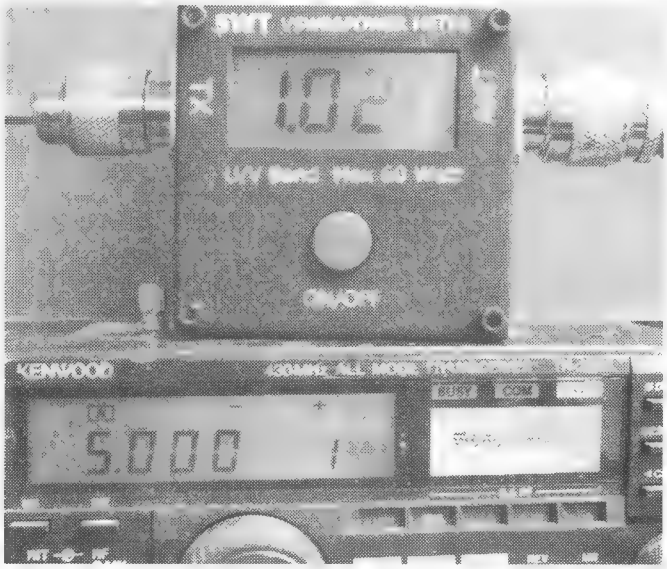


Photo 6: Protoype 70 cm beam driven with 25 Watts at 435 MHz.

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| 5 ele 20 mtr beam 40 foot boom | $995 |
| 6 m 8 ele 12 D B D gain | $408 |
| Top loaded 160 m vert | $474 |
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| 17 ele high gain 70 cm, 3 m boom | $152 |
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# 2008 Victorian ARDF Championships Report

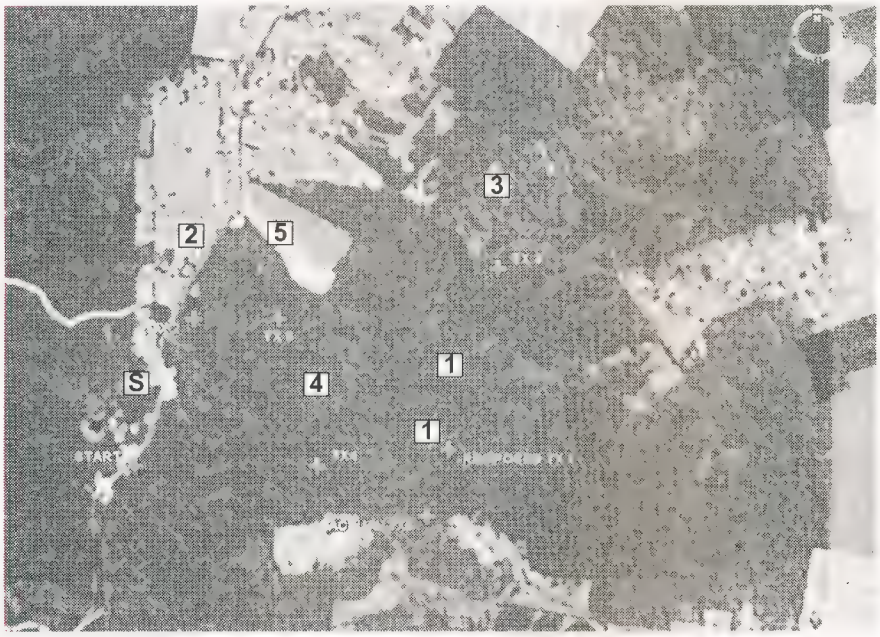
Jack Bramham VK3WWW

On Sunday 20th July 2008, 14 participants travelled to the township of Enfield in Western Victoria to contest the Victorian Amateur Radio Direction Finding Championships.

This event was held in conjunction with the Eureka Orienteering Club based in Ballarat. A section of the Kurucaruc Creek North Orienteering map was used to set both the Orienteering course and the ARDF course: the Kurucaruc Creek area is well forested but is fairly clear allowing competitors to head mostly in the direction of the signal quite quickly.

Five transmitters were placed in the forest and were transmitting Morse code idents, the frequency for the transmitters was 145.300, the VK national ARDF 2 m frequency, and the antennas were horizontally polarised. Transmitters operate on a five minute cycle, this means each transmitter takes a turn to transmit for one minute and then is quiet for four minutes. Competitors leave the start at 5 minute intervals, reducing the chance of one following the other.

This event was also a lead up event to the World Championships to be held in Hwaseong Korea from 2nd to 7th of

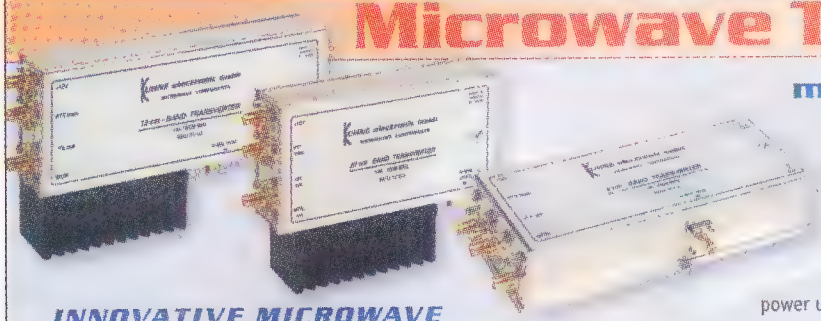



The Kurucaruc Creek course near Enfield VIC

## Results

| Name | Call | Course | Max TX | TX Found | Total Time |
|---|---|---|---|---|---|
| Bryan Ackerley | VK3YNG | Old Timer | 4 | 4 | 1:14.18 |
| Bruce Paterson | VK3TJN | Old Timer | 4 | 4 | 1:10.28 |
| Gary Panter | VK3TXO | Old Timer | 4 | 4 | 1:40.20 |
| Darian Panter | VK3FAST | Junior Male | 4 | 2 | 1:41.16 |
| Marta Salek | SWL | Open Female | 5 | 2 | 1:31.20 |
| Ryordan Panter | SWL | Junior Male | 4 | 0 | 2:34.20 |
| David Beard | VK3XAJ | Old Timer | 4 | 4 | 2:14.40 |
| Pam King | SWL | Veteran Female | 3 | 2 | 2:57.00 |
| Peter Malony | SWL | Veteran Male | 3 | 3 | 2:34.59 |

# Microwave Transverters



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| Frequency range IF | 144 ... 146 MHz | 144 ... 146 MHz | 144 ... 146 MHz | 144 ... 146 MHz | 144 ... 146 MHz |
| Output power | typ. 2.5 W | typ. 1 W | typ. 400 mW | typ. 250 mW | typ. 200 mW |
| RF input power | max. 5 W, adjustable (0.5 ... 5 W) | max. 5 W, adjustable (0.5 ... 5 W) | max. 5 W, adjustable (0.5 ... 5 W) | max. 5 W, adjustable (0.5 ... 5 W) | max. 5 W, adjustable (0.5 ... 5 W) |
| 10 MHz reference freq. input | typ. 2 ... 10 mW | typ. 2 ... 10 mW | typ. 2 ... 10 mW | typ. 2 ... 10 mW | typ. 2 ... 10 mW |
| Noise figure @ 18 °C | max. 0.8 dB | max. 0.8 dB | typ. 0.9 dB | typ. 1 dB | typ. 1.2 dB |
| Receive gain | min. 20 dB, adjustable | min. 20 dB, adjustable | min. 20 dB, adjustable | min. 20 dB, adjustable | min. 20 dB, adjustable |
| Supply voltage | +12 ... 14 V | +12 ... 14 V | +12 ... 14 V | +12 ... 14 V | +12 ... 14 V |

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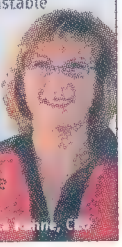

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September 2008 (http://www.2008ardf.org/). Two of the competitors from this event will represent Australia and compete against ARDF competitors from 29 countries, having used this event for training.

Competitors were catergorised by age and gender. These were Junior (under 19), Old Man (no age restriction), Old Timer (over 40) and Veteran (over 50). There is one other category, Super Veteran (over 60) but this one was not available for this event. Also, only the OM competitors need to locate all five transmitters for a perfect score. Competitors in any of the other categories need only to find a maximum of four transmitters.

Time limit for this event was 90 minutes, all competitors had to find as many of the three, four or five transmitters in their category as possible and be finished before the 90 minutes are up.

If a competitor is over time then that results in disqualification, so the best score for each category would be the competitor with the most number of transmitters located in the shortest possible time.

Looking at the results from the event some of the competitors misunderstood this rule or were not concerned about being disqualified as they found it more of a challenge to locate all of the transmitters in their category.

Waiting at the start. L-R Marta Salec (ARDF Group), Pam King (ARDF Group), Jack VK3WWW, Bruce VK3TJN and Dianne Shalders (ARDF Group).

All went pretty smoothly on the day but there was one problem with the location of transmitter 1: it was placed just off the map by about 50 m – this was not intentional and the course setter (me) must apologise for the error. This confused those who were able to follow their map but for the competitors not really using the map and finding the transmitters by signal alone it was not a problem.

**ar**

VK3WWW Waiting to make sure the transmitter comes on in sequence before moving on to set the next transmitter. Note: to meet International regulations the antenna is a horizontally polarised turnstyle.

# Working Mildura on 2.4 GHz

Chas Gnaccarini VK3PY

**A recent business trip to Mildura in February by Bert VK3TU provided the opportunity to test the path back to Lara (near Geelong) on the 2.4 GHz band.**

David VK3QM, Charlie VK3NX and I would be the "home" team while Bert and his colleague John VK3VN would take one of our 2.4 GHz portable systems with them.

The distance to Bert's chosen location (about 15 km west of Mildura, QF15xs) is about 460 km. The path of course is way beyond line of sight and further compounded by mountainous terrain at the southern end.

Under the expected weather conditions we would need to rely on aircraft enhanced propagation (AEP) for a successful contact as no tropospheric ducting was forecast.

AEP exploits the presence of high-flying aircraft passing near the mid-path of the two stations. Providing the aircraft is large enough (for example, a passenger jet) and flying high enough (8,000 to 13,000 m - 25,000 to 40,000 ft) to be "visible" to the antennas at both ends, sufficient signal will be forward-scattered to sustain a brief contact.

Previous experience over the same path on 1296 MHz gave us reasonable confidence of success on 2.4 GHz. At these frequencies it is almost impossible to do weak-signal work from a suburban location due to the clutter of buildings and trees, both of which introduce prohibitive signal attenuation.

Additionally, on the 2.4 GHz band, QRM from WiFi-enabled consumer electronics raises the background noise to unacceptable levels. For these reasons, we took the "home" station to an elevated ridge a few kilometres west of our home town of Lara, in grid square QF21dx.

Bert and John would be in the sparsely populated plains some 15 km west of Mildura – no hills to exploit, but then none to get in the way either. There would also be no WiFi QRM to desensitise the receiver.

The equipment at both ends consisted of David VK3QM's two home-brew transverters, each running 25 W PEP. The Lara antenna was a 1.2 m diameter dish with a VK2AES-designed cavity-backed dipole feed, while due to vehicle luggage space constraints, Bert had to make do with a 90 cm ex pay-TV grid-pack dish. Operational co-ordination was on 80 m SSB.

On the micro-does not usually call CQ! Contacts need to be pre-arranged and a reliable means of communication is necessary to co-ordinate operations. To convey some idea of the difficulties facing long-distance microwave operators, consider that:

- The antenna half-power beam width is about 8 degrees in both azimuth and elevation (slightly wider for the smaller grid-pack dish). Pointing accuracy is critical.
- The combined frequency uncertainty of the Tx/Rx systems could be as much as +/- 4 kHz. While this is better than one ppm each at 2.4 GHz, it is enough to ensure that we would need to tune around to find each other.

*Continued over*

Bert VK3VN and his gear set up near Mildura. Photo by Bert VK3VN.

Charlie VK3NX and Chas VK3PY with the equipment at Lara. Photo by David VK3QM.

# A Power Distribution Box Using Anderson Powerpoles

Henrik Stenstrom VK2HHS

Here is a small project that should only take an evening or so to put together.

Inspiration came after the recent John Moyle Memorial Field Day. A benefit of a day in the field is seeing how others set up their portable stations, and what works and what doesn't.

I was particularly impressed with the small 12 V distribution box of fellow amateur, Laurie VK2JAH. Checking websites for prices for similar products was all the extra motivation I needed to build a few of these together.

The bill of materials is quite modest; it may all be in your magic box. I sourced my parts from Altronics as I was ordering other bits and pieces at the same time. Cost was about $6 not including the Anderson Powerpole connectors.

Construction is simple if you adopt the adage of measure 20 times: cut once.

The Anderson Powerpole contacts are crimped and soldered to 20 mm lengths of 1.5 mm solid copper wire. I used hard drawn copper antenna wire leftovers.

The circuit board is drilled 1.5 mm to accept the Powerpole sets, 3 mm for the standoff and slotted at one end for the blade contacts of the rocker switch.

Use the circuit board as a template to position and nibble out clearance holes in the bottom of the Jiffy Box for Powerpole sets, fuse and switch. Install the switch (press fit) in the bottom of the jiffy box.

The Powerpole sets and fuse holder are then soldered into place on the circuit board. Use a Dremel tool with cut-off wheel to engrave the copper side of the circuit board to produce "tracks" as required. In my arrangement there is one input; all outputs are fused with three being permanently on and the other three switchable.

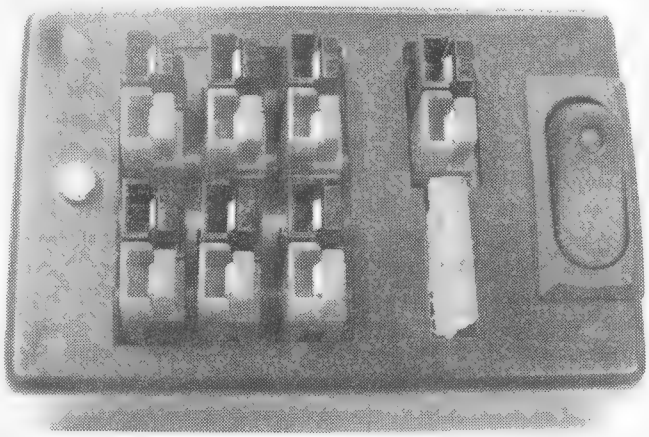
The completed circuit board is then installed upside down in the jiffy box from the top with one end supported directly upon the switch blade contacts and soldered in place. The other end of the circuit board is supported on the 15 mm standoff. The jiffy box lid forms the base of the box.

There you have it and I hope the pictures are worth their respective 1000 words.

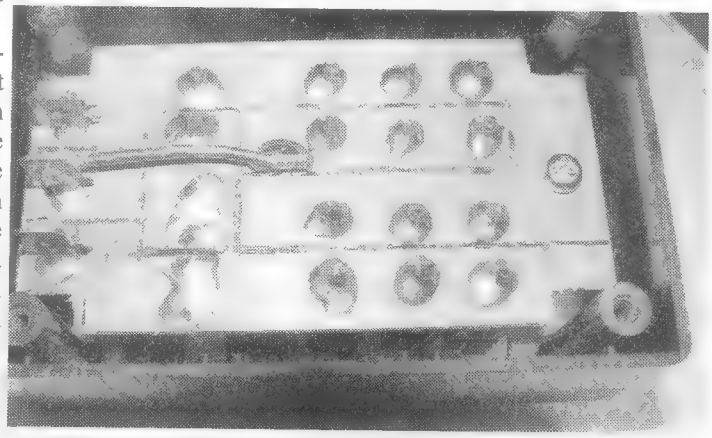
ar

**Materials Bill**

UB5 Jiffy box - H0205
Automotive style fuse 25A - S5910
Blade fuse holder - S6040
Switch - S3247
Additionally:
Anderson Powerpole connector sets x 7
Solid copper wire 1.5 mm x 30 cm approx
Single sided circuit board 40 x 75 mm
15 mm M3 standoff x 1
M3 screws x 2



The completed distribution box.



The underside of the distribution box, showing the circuit board and how it fits neatly into the chosen Jiffy box.

***Mildura on 2.4 GHz*** *continued*

Neither of us could hear the other station unless an aircraft was present in the right spot.

A typical aircraft pass over this path would produce an "opening" lasting less than a minute.

The procedure we adopted was to point the antennas on the right bearing as best we could, using GPS to establish this with reasonable accuracy.

We agreed that the Lara team would run a CW keyer on 2403.200 MHz while the Mildura team would listen, carefully tuning a few kHz either side of the expected frequency. If signals became audible, they would alert us on 80 m following which we would establish SSB contact on 2.4 GHz.

At around 0845 UTC, after about an hour of trying, Bert alerted us that signals were becoming audible.

We immediately went over to 2.4 GHz and quickly completed a contact with reports of 5x2, rising to 5x5 within seconds. The entire aircraft pass lasted less than 30 seconds. David and Charlie missed out, so we agreed to continue until another aircraft went over.

A little over one hour later, signals came up again and this time both David and Charlie made contact, albeit at somewhat lower peak signal strength.

Yet another grid square in the bag for each of us on 2.4 GHz!

ar

# Crystal Clear - The struggle for reliable communications technology in World War II

## Richard J Thompson

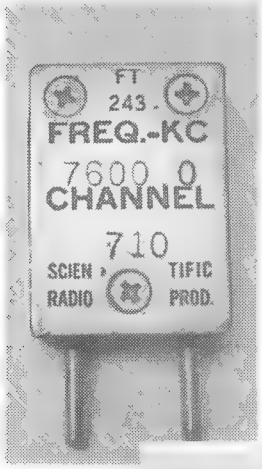
Reviewed by Peter Holtham VK4COZ

If you go to any hamfest, anywhere, you will find someone selling a box of crystals. In amongst the modern units in sealed metal holders you will probably see crystals dating from World War II. Easily identified in their bakelite holders, they come in two common styles: the FT243, and the slightly larger DC11 crystals.

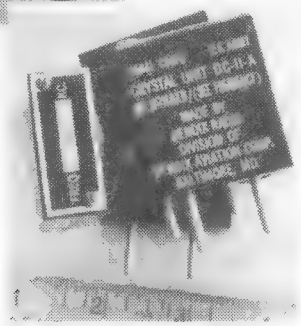
Look at the plate on the front of any FT243 crystal. You will see maker's names from A to Z. From Aircraft Accessories Corporation of Kansas City, Missouri, to Zenith Radio Corporation of Chicago, Illinois.

Have you ever wondered why they are so common? Or why there seem to be so many different makers? A new book by Richard J Thompson, "Crystal Clear" provides the answers.

At the start of World War II, the United States military was still trying to decide the best way to control transmitter and receiver frequencies in the field. Was it best to use the proven but fiddly master oscillator approach, or gamble everything on simpler crystal circuits?




The ubiquitous FT 243



The larger DC 11A

Crystal control of oscillators was not new. Amateur radio operators and commercial radio stations have used them since the 1920s. But the military wanted the flexibility of being able to change frequencies at will. So they leaned towards the fully tuneable master oscillator. However, tests in the late 1930s showed the value of crystal controlled radios. It was quick and easy to change frequency, even while bouncing around in a tank or a jeep.

But any decision to go with crystal control would raise a new problem. In 1941 only about 100,000 crystals per year were being made in the United States. Millions would be needed. How could enough be made?

The task of putting what was a small cottage industry onto a large-scale wartime footing fell to the U.S Army Signal Corps.

The problems they faced were enormous. Raw crystal with the right properties was only found in Brazil. The conditions under which it was mined and sold were primitive. Men and machines had to be sent to Brazil to improve the flow of raw material. Getting the quartz to the U.S by ship took two to three months. Crystal makers could not wait that long and from 1942 the raw quartz was shipped by air.

New manufacturers had to be shown how to inspect raw crystals using X-rays, how to saw off blanks to minimise wastage. They had to be convinced to use small but common raw crystals instead of the increasingly rare but easy to work large crystals.

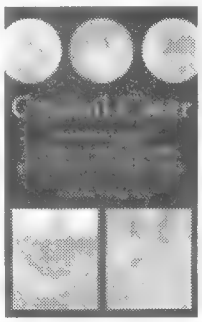
Just when the early difficulties of supply and large-scale manufacture seemed to have been overcome, a crisis broke. In 1943, reports of crystal failure started to come in from all theatres of war. Oscillators stopped oscillating or drifted off their correct frequency. Vital communications were threatened. As a stopgap measure, grinding teams were formed and sent out to repair defective crystals.

Meanwhile, the Signal Corps put a huge effort into finding the cause of the problem. Research showed that the original grinding process left minute particles of broken quartz in surface cracks. Once the crystal was in use, these particles vibrated free, damping or stopping the oscillation. Water vapour penetrated the cracks causing further damage. By July 1944, a simple solution had been found. After initial grinding, the crystal was acid-etched to its final frequency, removing all traces of loose quartz. Crystal controlled oscillators now started every time and stayed on frequency. The crisis was over.

By the end of the war, over 100 manufacturers were producing nearly 30 million crystals a year. No wonder they are still so plentiful at hamfests.

Richard Thompson's history of the early US crystal industry is not light bedtime reading. But if you have an interest in one of the basic technologies of modern electronics you will find it well worth the effort. It can be argued that the development of reliable mass-produced crystals during World War II was as important to the final outcome as radar and the atomic bomb. On the basis of the evidence in this book, it is hard to disagree.

**Crystal Clear - The struggle for reliable communications technology in World War II**



(ISBN 0-470-04606-6) is published by Wiley Interscience for the IEEE Press. It is illustrated with 25 black and white plates.

# Disaster communications Sichuan earthquake and GAREC-08

Jim Linton VK3PC*

**A vital resource for any community is its radio amateurs who have the knowledge, skill and equipment to step in 'when all else fails' to provide communications in times of natural and other emergencies.**

This is what occurred in the aftermath of the devastating Sichuan Province earthquake in the Wenchuan area of China's Sichuan province and thousands stepped up to help with the enormous disaster recovery and relief efforts. It was a solid example of radio amateurs being rapidly deployed to help maintain vital communications so first responders and critical personell could more efficiently manage the crisis.

The magnitude-8 earthquake struck on the afternoon of 12 May. The Chinese Government has put the death toll at almost 70,000 people, 374,176 injured, and nearly 20,000 people considered missing. In the worst hit areas 80-90 per cent of houses were destroyed and 46 million people left homeless.

Tremors from the powerful 'quake were felt throughout the region including in Vietnam, Thailand, Mongolia, Bangladesh, Nepal, India, northern Pakistan and Russia.

Photo 1: Survivors amid the devastation.

China's central government responded quickly. The Prime Minister took off from Beijing within two hours of the 'quake, heading for Chengdu, while a massive mobilisation of army rescue forces rushed to the epicentre by foot due to road access being cut.

The Chinese Radio Sports Association (CRSA) reported that soon after it struck, radio amateurs travelled into its epicentre trekking across severely damaged roads to set up communications.

Two ham radio operators had a repeater set up by the morning of 13 May, enabling the transmission of rescue instructions, status reports and as a main communication channel for public use. Among the repeater traffic were communications for the Mayor of Mianzhu City, who gave orders to those on the front line rescue and recovery activity.

Hams around Chengdu, Mianyang area were among the first to setup their emergency stations. Liu Hu BG8AAS of Chengdu reported soon after the earthquake that the local UHF repeater had survived and more than 200 hams were using it, kept busy directing vehicles transporting the wounded. Yue Shu Qiang BA8AB was also active from Chengdu on the 40 metre band.

Liu Hu, after sheltering in his office for several minutes after the earthquake struck, then set up an emergency communications station using portable equipment. He learnt that the 'quake epicentre was Wenchuan, 90 km to his north, and that communications there had been cut. Hams in the province began to gather information and provide communications. Liu Hu continued radio operations at home that evening noting that many of his neighbours had left the area having been made homeless.

An emergency command centre for the Sichuan Amateur Radio Emergency Service (SARES) was set up on 13 May in an art museum at Sansheng that was considered to be a safe structure. The centre used the callsign BY8AA, and under its control many vehicles helped with relief work and thousands of injured were evacuated. SARES also set up radio relays with other centres.

SARES had three groups. The Information Group was responsible for organising information from the disaster areas and reporting urgent needs, so that Command Group arranged the thousands of ham volunteers to send supplies while the Logistics Group dealt with getting it where it was needed.

On the day of the earthquake the CRSA called for a series of frequencies, 7050 kHz, 7060 kHz and 14270 kHz, to be kept clear during the critical period after

the earthquake. It readily acknowledged with thanks the cooperation and efforts made by all amateur radio societies and individual radio amateurs to keep those frequencies clear.

The CRSA issued a QSP to all radio amateurs which said, "Amateur radio stations in the disaster area and surrounding areas... should be used unconditionally to assist the local earthquake disaster relief authorities".

"If any radio signal is heard from the disaster area, please do your best to understand what is most needed by people in that area and report it to the local government authority".

"For emergency communications purposes, amateur radio stations may also be used to pass messages for local residents on a temporary basis until local telecommunications services resume."

Long distance telephone lines were either cut or congested in the early days of the disaster and this is where amateur radio HF links were used, including one in the provincial city of Chengdu to give the Red Cross a link to Beijing.

VHF and UHF repeaters were in heavy use, both those which survived the 'quake and others pressed into service to provide much needed local communications including front line rescue and recovery activity. They enabled communications for a 100 km radius from Chengdu, the capital of southwest China's province of Sichuan. More repeaters were set up in both Beichuan and Mianyang, among the worst hit areas outside the epicentre, to form an effective amateur radio communication network.

Government officials and news media recognised that when communications failed after the Sichuan earthquake, it was amateur radio operators who stepped in to provide vital links. China Central Television (CCTV) reported on 26 May, "When all other communication means failed, amateur radio operators came out! An amateur radio emergency communication network was set up and one of the commanders, Liu Hu called for amateur radio operators on air to provide services for disaster relief".

"Thankfully one main repeater survived during the earthquake, this repeater provided 100 km coverage to Mianyang. Amateur radio operators from Chengdu, Shenzhen, He'nan went to the centre of the disaster area, set up repeaters in Beichuan county, and provided various valuable first hand

Michael Owen VK3KI (right) and Hans Zimmermann F5VKP/HB9AQS at GAREC-08.

BD8ABM operated HF from his vehicle in the epicentre.

Sichuan Amateur Radio Emergency Service: BY8AA plays a key control station role.

information from the centre."

The radio amateurs involved in front line areas came face to face with the horrific reality of the disaster and its chaos, experienced hundreds of after shocks and endured extremely high temperatures.

The CRSA, through Fan Bin BA1RB, informed the international amateur radio community of what was happening, including three situation reports.

According to Liu Hu, the emergency communications effort resulted in about 300 pages of written logs and information, with 30 hours audio, two hours video and 2 GB of photos taken in six days following the earthquake.

The CRSA also produced a visual presentation to give an overview of the role emergency communications provided during the disaster, and what that radio society proposes for the future.

The slide show and additional information was delivered to a keen audience at the fourth Global Amateur Radio Emergency Communications Conference (GAREC-08) in Friedrichshafen, Germany, 26 and 27 June, by the IARU Region 3 Chairman, Michael Owen VK3KI.

The conference organisers and delegates were very pleased to see the CRSA presentation and learn more about the role played by amateur radio after the Sichuan earthquake. IARU International Coordinator for Emergency Communications Hans Zimmermann F5VKP/HB9AQS was very impressed by the timely arrival of the CRSA slideshow and its content. Hans said much of the discussion at GAREC-08 was on how to create a disaster response capability for those IARU member societies who do not have the necessary structures and mechanisms in place.

Some countries, he noted, have not aligned their radio regulations with changes made at the World Radio Conference in 2003, to enable their radio amateurs to train for and provide communications in times of emergencies.

Michael Owen said prior to WRC-03, the ITU Radio Regulations required agreements to be entered into between individual countries before their radio amateurs could pass third party traffic. He said, "What these changes mean is that an administration may allow its radio amateurs to pass international messages on behalf of a third party, at least in the case of emergencies or for disaster relief. They also encourage the administrations to take steps so their radio amateurs can prepare for and participate in disaster relief communications. The changes showed that the ability of radio amateurs to provide emergency communications was recognised, and the WRC-03 acknowledged that in many cases national laws would have to be changed to allow such communications."

Hans said, "Only a short time ago, there were very few hams in China - the Chinese Radio Sports Association (CRSA) sets a great example for what can achieved very fast in a favourable regulatory environment and with personal engagement."

In 2000 there were only 500 amateur stations, but now there are well over 20,000 thanks to the efforts of the CRSA, with continued strong growth expected.

Hans said, "Through their immediate and effective response, our fellow hams in China have shown what amateur radio can contribute to disaster response."

He said the ITU sent a message to all national administrations through the revision in 2003 of Article 25 of the International Radio Regulations.

Hans said, "It's now in the hands of the national authorities, to implement the authorisation of third party traffic in emergency communications training. Only those who are prepared can respond to an emergency. And it is up to the national societies and the groups specialising in emergency communications to make the respective administrations aware of this need. It's a sad fact, that always, 'something has to happen, before something happens'. The tragic events in China and the role of the Amateur Radio Service in the response to it are a great opportunity to create such awareness!"

GAREC-08, in its closing statement, congratulated the Chinese Radio Sports Association (CRSA) for its outstanding contribution and the Chinese amateur radio operators in their support to humanitarian response to the tragic events in May 2008.

The ITU is now more aware of the need for action on the regulatory changes and that goal will be sought through its contact with national administrations. The ITU representative at GAREC-08, Dr Cosmas Zavazava, took a copy of the CRSA slideshow for presentation to the ITU.

The CRSA is also responding to the lessons learned from the Sichuan earthquake by seeking the help of other IARU radio societies to further improve disaster communications procedure and documentation. In its action plan is education for radio amateurs and achieving closer cooperation with the Chinese *Red Cross* Foundation and government organisations involved in disaster relief. The CRSA has an annual disaster communication simulated emergency test (SET) each July, and actively joins the regular global SETs.

It encourages hams to take part in field day operation and enforces the need for them to have skills such as message handling, the use of simple antennas and setting up portable equipment.

With statistical evidence that the number of disasters occurring around the world has steadily increased, these types of preparations are vital for amateur radio to effectively play its role in disaster relief communications.

Immediately after GAREC-08 the IARU Administrative Council met in Germany and praised the CRSA for its achievements and contributions. It also decided on the theme "Amateur Radio: Your Resource in Disaster and Emergency Communication", for the next World Amateur Radio Day, April 18, 2009.

*Jim Linton VK3PC is the Chairman of the IARU Region 3, Disaster Communications Committee.

**ar**

**The ITU Radio Regulations were changed at WRC-03 to read:**

**25.3**

Amateur stations may be used for transmitting international communications on behalf of third parties only in case of emergencies or disaster relief. An administration may determine the applicability of this provision to amateur stations under its jurisdiction.

**25.9A**

Administrations are encouraged to take the necessary steps to allow amateur stations to prepare for and meet communication needs in support of disaster relief.

If the Amateur Service is to adequately prepare for, and play its role in emergency communications, 25.3 must be applied to the national regulations of individual nations. In order to be able to fully prepare for emergency communications, as encouraged by (25.9A), it is critical that national regulations do not inhibit third party traffic (TPT) for such preparation.

# The ham trip of a lifetime

**J.A. (Tony) Hutchison VK5ZAI**
National ARISS Coordinator & ISS Telebridge Earth Station

**VIP tours through NASA's Johnson and Goddard Space Centers, BBQs with Astronauts, guided tours personally arranged for us of the Smithsonian and Dulles Air and Space Museums, two days at the Dayton Hamvention, sailing on Lake Ontario, and chauffeured around Toronto and Niagara Falls. If this was not enough, add sightseeing in the Canadian Rockies, more BBQs with Amateurs, a chauffeured tour of Vancouver, visiting Pearl Harbour and relaxing on Waikiki beach before returning home, all in a month.**

It all started back in May 2007 when Dieter KX4Y, a close friend and an ARISS colleague, suggested that I visit the Dayton Convention in 2008. He said to let him know by October so he could book accommodation. I mentioned the trip to Kevin VK4UH/VK5KJ who said he would be interested in coming and could we have a look at the Johnson Space Center as well along the way.

On mentioning the idea to other members of the SERG (South East Radio Group) we soon had a group of six interested in the trip, the others being Col VK5DK, John VK5DJ, David VK5HDW and John VK5JA.

After a discussion of what everyone's interests were and what we would like to see, we all agreed we needed a month to make the trip worthwhile. As our interests were all very similar planning was easy.

We decided to fly into Los Angeles and across to Houston then work our way north (and east) through the US to Dayton then on up to the lakes region of Canada. From here we would travel east to west taking in the Rockies along the way and stopping a couple of days in Hawaii on the way home.

We booked our thirteen aircraft flights through a travel agent and I handled the accommodation side, a combination of staying with friends and at hotels along the way.

Everyone agreed they would like an "in depth" tour of both the Johnson and Goddard Space Flight Centers if possible. This required forwarding everyone's personal details several months ahead to NASA so they could do security checks.

In September I emailed Dieter to say that six VKs would be attending Dayton, and could he handle the accommodation for us? This he did at the University of Dayton South Campus for three nights.

Five of us departed from Mt. Gambier Airport on May 4 for Melbourne to catch our international flight the next morning for Los Angeles via Auckland. Kevin flew direct from Brisbane to Auckland.

On arriving in LA we booked a four hour tour for the following afternoon of Hollywood, Beverly Hills, Marina del Ray, Venice Beach, and Santa Monica etc. We went for an exercise walk down the street the next morning,We had only gone for half an hour when we spotted a beam on a tower behind a house. Curiosity got the better so we knocked on the door and were greeted by Bob K6CUK and wife Norma WA6MIK. In typical amateur fashion they welcomed the six of us in and showed us their shack and we chatted for an hour or so before returning to catch our bus tour of the glitzy parts of LA.

On May 8 we left LA at 7:50 am arriving Houston Hobby Airport at 12:55 pm flying South-West Airlines. At LA, the hostess gave the six Australians on board a special welcome on the PA before singing to the passengers then asking everyone to fasten their seat belts for takeoff.

Nick KC5KBO met us at Hobby Airport and took us all back to his home where Renee KC5VMA had lunch waiting. My wife Jill and I have known Nick and Renee for some years; they are both engineers, Nick having been with NASA for forty years and Renee with Boeing for a slightly lesser time.

Nick is also an ARRL Examinations Officer and sits most of the astronauts for their amateur licence before flying.

He is also very active with getting youth into amateur radio and has a group of "Hamsters". They both visited us in April and spoke to the SERG about their work. They hosted the six of us for four nights, taking over the whole top floor of their home. The first night they put on a BBQ for us all, inviting staff from JS.

Photo 1: Amateurs gathered for a BBQ at Nick and Renee's home. NASA astronaut Barbara Morgan KD5VNP is second from left in the front row.

Astronaut Barbara Morgan KD5VNP was a guest: Barbara flew in the Space Station last August and did her astronaut training with Christa McAuliffe who lost her life in the Challenger disaster in 1986. I was privileged to handle the contact she did between the ISS and her old school, McCall-Donnelly in Idaho. Later in the evening Barbara personally autographed photos for everyone in our group.

We met young amateurs from Nick's "Hamsters Club" who had gained their licence through a special young persons training program. Americans are very good at encouraging young people and they are exceptional at running emergency nets. As a result their governments are very encouraging and even allow 'Amateur Callsign Vehicle Plates' for $1 per year.

The following morning we went with Nick to the Johnson Space Center where our security details were checked and our passes issued. The six of us along with Nick and guide then boarded a 35 seat NASA coach and were first taken to the Neutral Buoyancy Laboratory.

This is an enormous swimming pool 12 m deep and the size of a football field with a full sized mock-up of the space station on the bottom along with a mock-up of the Hubble telescope. This is where the astronauts train for around twelve months before flying into space. Working in the pool under neutral buoyancy conditions wearing gloves and a space suit is as close to the real thing as they can get.

After spending an hour here and meeting John Grunfield, who will be doing repairs to Hubble in a month or two, we were bussed back to Mission Control where we inspected both the ISS and Shuttle Mission control centres before being taken into the original Mission Control Room where they handled the lunar landings. One looks at this equipment now and thinks how basic it is! Kevin did get a chance to call on the RED phone but the President did not answer!!

Next we went onto the building that houses the full size mock-up of the ISS; this is used for astronaut training purposes as well. Waiting to meet us here was Bill McArthur KC5ACR. He is a devoted amateur, licensed for many years. Bill is a veteran astronaut, having four space flights to his credit, the last flight on the ISS in 2006 for six months duration and logging nearly 2,000 amateur contacts during that time.

He is a retired Colonel with the US Army and is classified as a Master Test Pilot with over 9,000 flying hours in 41 different aircraft. After a walk through the ISS with Bill explaining everything, we went onto the shuttle they train in, again with Bill explaining everything in detail.

After presenting Bill with a gift from the Mt. Gambier and Kingston Councils, we had lunch with Nick and Renee before heading to the JSC Tourist Center where everyone inspected the capsules that returned from space, watched a movie, and made purchases from the souvenir shop before returning back to Nick and Renee's for the evening.

During the next two days Nick and Renee took us on a Houston Harbour cruise, toured a TV station, walked the Houston underground, went shopping at several electronics stores and tried our hand at pistol shooting and horse shoe throwing.

Photo 2: The Neutral Buoyancy Laboratory, a key venue for astronaut training. The people at top left show the scale.

On Sunday May 11 we said goodbye to Nick and Renee and caught our flight to Baltimore where Frank Bauer KA3HDO met us at the airport. Frank is now Chief Engineer for the Space Explorations Systems at Goddard Space Flight Center. He is involved with the development of sustained human presence on the moon.

In 1997 Frank received NASA's Exceptional Achievement Award for his work on the space-borne GPS network. He is also International Chairman of ARISS (Amateur Radio on the International Space Station).

Here again all six of us were hosted by Frank and Janet, taking over their home! Another BBQ was organised for us so we could meet other members of the ARISS team and local amateurs. The next day after the mandatory security checks we went through the workshops at Goddard and saw the new Lunar Orbiter being assembled and tested along with a hands-on inspection of the new equipment to repair the Hubble telescope. The NASA workshops at Goddard are really an engineer's dream.

On Tuesday, May 13, Will Marchant KC6ROL set up a conducted tour for us of the Smithsonian Air and Space Museum: one could spend several days viewing this complex. The Flyer, Wilbur and Orville Wright's aircraft, is on display there.

The following day Will arranged a conducted tour at the Udvar-Hazy annex at Dulles Airport. This is new, only around 3 years old and is spectacular; again an air and space museum and part of the Smithsonian. As you walk in the main entrance the first thing that greets you is the Blackbird SR-71A, the fastest aircraft in the world, behind this is the Enterprise, the first space shuttle. There is a great display of aircraft including Phantoms, the Enola Gay, the B-29 that dropped the atomic bomb on Japan, a Boeing 707, a Concorde, plus dozens of other aircraft from the Wright Bros era till today. There were also many missiles and aircraft engines on display.

Photo 3: John VK5JA, Col VK5DK, Kevin VK4UH, Bill KC5ACR, Tony VK5ZAI, John VK5DJ and David VK5HDW outside the Johnson Space Center's reception area.

Photo 4: Lunar Reconnaissance Obiter being assembled at Goddard Space Center.

Photo 5: The Blackbird at the Udvar-Hazy Center.

As well as all the above during our four days in Washington DC, we somehow squeezed in a tour of the Historical Electronics Museum in Baltimore, visited the White House (outside only!) and Arlington War Cemetery.

Thursday May 15 was a 4:30 am start: after saying goodbye to our hostess,

Photo 6: David VK5HDW buying up at Dayton Hamvention.

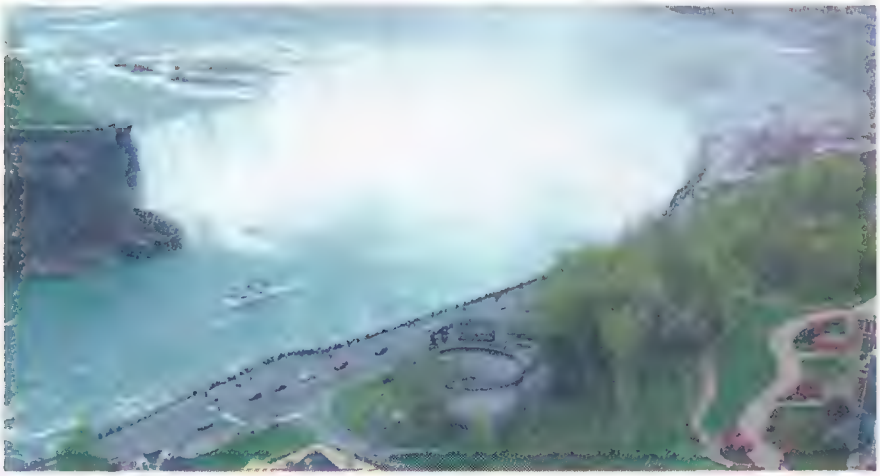


Photo 7: Niagara Falls from the Observation Tower.

Photo 8: Part of the Hammond Radio Museum at Guelph, Ontario

Janet, and Michelle, their daughter; Frank drove us to Baltimore Airport to catch our flight to O'Hare Airport in Chicago where we had to wait an hour or two to board our next flight to Dayton, arriving there around lunch time. Here we caught a taxi to the University of Dayton, South Campus, where Dieter had booked us in.

Dieter took ill earlier this year and has recently had surgery. Unfortunately his recovery is slow and he could not make Dayton this year. It was a big disappointment for us both – after working together on many ARISS projects we still have not met.

The next day it was the Dayton Hamvention, with 25 to 30,000 amateurs attending, trade stalls and hundreds of flea market stands outside. Dayton has to be experienced to be believed, every amateur should make the trip at least once in a lifetime.

We all took or bought handheld radios and were surprised that we found a frequency on 70 cm with little or no QRM so we could stay in contact.

This worked out well as we all went our own ways to look at things but could all meet for lunch or contact each other when needed. We ended up with several other VK amateurs on the frequency as well.

Several in our group made bulky purchases and organised shipping back to VK from the Convention. That night we split up and attended various dinners. Kevin and I attended the Dayton AMSAT dinner where I was guest speaker on the Friday night. Mark N8MH drove us back to the Dayton University where we were staying.

Robin Haighton VE3FRH, a past president of AMSAT-NA, and Diana, his wife, stayed with us when travelling "down under" and kindly offered to show us around Ontario after Dayton . They had beds for three of our party, the other three stayed in a motel close by. We left Dayton on the Sunday morning with Robin in his van, with all our luggage and went via Detroit arriving at Burlington, Ontario, around seven hours later. After a walk to stretch our legs we settled in at Robin and Diana's and the motel for the next five days.

The next day, May 19, we drove down to Niagara Falls for the day. Although it was raining, the Falls were quite spectacular. Many photos were taken from alongside as well as from

the tower overlooking the area. Kevin VK4UH, John VK5JA and John VK5DJ took a helicopter flight to get even better photos.

The next day was another full one: Rob took us up to Toronto where we ascended the CN tower; this was the world's tallest building, the top being 1,815 ft above the ground. We went to the observation level at around 1,000 ft and it took a bit of convincing to get one's feet to walk out onto the glass floor and look down! In the afternoon we visited the Ontario Science Museum.

At this point of our trip, Kevin left our group and flew out for London to catch up with his family. The following day, with one less, we went sailing on Lake Ontario for three hours and visited the Hammond Museum of Radio in Guelph.

This is really well worth the visit especially for anyone interested in vintage radios. They have sections on Broadcast, Military, Amateur, Hammond Radios, and Tubes etc. They also have an active Amateur Station with the call signs of VE3BJ and VE3HC. Visiting amateurs are welcome to use the station if they desire and we found it interesting to swing the beam west to call VK but nothing was heard.

Photo 11: Dick AH6NM and Nancy WH6PN at the ARISS Earth Station at Sacred Heart Academy in Honolulu.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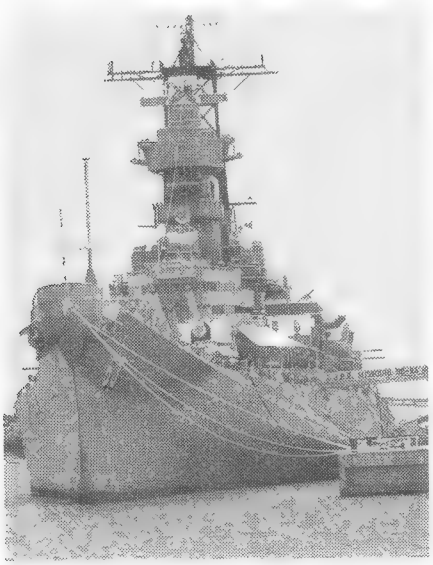

Photo 10: USS Missouri (Mighty Mo)

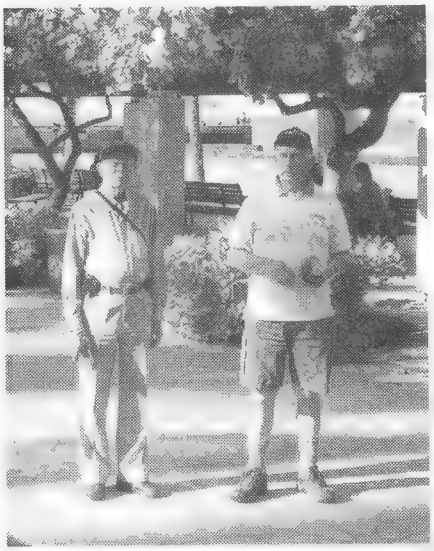

Photo 9: John VK5JA and Col VK5DK at Waikiki Beach.

On Friday May 23, we left our hosts Robin and Diana and the wonderful time they had given us; this time bound for Calgary. We arrived around lunch time and had our first easy day with nothing planned.

The trip so far had been "full on" every day, trying to take in everything that our hosts and others had shown us. What with this, security checks at airports, and meeting flight schedules, we were all starting to wear down a little.

The next morning we picked up our hire vehicle, a new Ford Explorer with a GPS included. David VK5HDW was our designated driver and did a great job; we headed for Banff in the Rockies where we had booked in for three nights at the "Driftwood Inn".

During the three days here we went sightseeing with nothing in particular planned. We took in Lake Louise, Sulphur Mountain, The Cosmic Ray Station and the surrounds. This is really some of the most beautiful country you could ever imagine; photos just do not do it justice. We walked the length of Lake Louise which was just thawing with ice and snow still on top. We found Banff expensive, but being a tourist area this was expected.

Tuesday May 27 saw us on the way back to Calgary again to catch our flight over the Rockies to Vancouver. Our one regret here was that we did not drive to Vancouver through the Rockies from Banff, we had gained that much confidence in David's driving.

Shortly after arriving at our motel in Vancouver a little after lunch time on May 27, Barry VA7GEM and Jane called in two vehicles to pick us up and take us to their home in the mountains overlooking Vancouver Harbour. There we enjoyed a BBQ tea. I met Barry and Jane several years ago when they were travelling Australia, they are both avid gem collectors hence the call sign. Barry had the call VK2GEM while in Australia.

The following morning they arrived again in two vehicles, this time to take us on a sightseeing tour of Vancouver for the day before flying onto Hawaii that night. Vancouver is a lovely city with all its parks and gardens and a beautiful harbour. Most of the ships depart and return from here to cruise the Alaskan coast.

We did not arrive at our hotel on Waikiki Beach till nearly midnight Hawaiian time. We noticed the change in temperature coming from Banff with snow all around to Honolulu in a little over 24 hours.

I had an appointment at 9:00 am the next morning with friends of Barbara Morgan's and Dr. Luke Flynn, the Director of the Hawaii Space Flight Laboratory to discuss the deploying of a new satellite they propose to launch in 2010.

After this meeting we visited Pearl Harbour and spent the rest of the day there. After watching a movie on the bombing of the Harbour, we did a boat cruise over to the Arizona Memorial. This memorial is built on top of the Battleship Arizona lying where she sank with the loss of nearly 2,000 lives. The outline of the ship is quite visible just under the water with a few parts just above. One can still see droplets of fuel oil seeping to the surface after all these years.

After catching the launch back to the shore, we then caught a bus to Ford Island to board the Battleship USS Missouri. The Missouri last saw service in the Gulf war and is now retired and open for inspection in Pearl Harbour. On September 2, 1945, Japan signed the surrender document on the deck of the USS Missouri in Tokyo Harbour.

"Mighty Mo" as she was affectionately known, has nine sixteen inch (406 mm) guns that could fire a shell 40 km. The ship's communications centre has been taken over by amateurs and has been restored close to the original with an active amateur station on board, call-sign KH6BB. Luckily we were given a guided tour of the radio room by Ned KH7JJ after the guides at the gate spotted the call-signs on our hats. The radio room is usually off limits to visitors.

Friday May 30. After some last minute shopping and a walk along Waikiki beach in the morning, it was back to the Queen Kapiolani Hotel where I had arranged to meet Dick AH6NM and Nancy WH6PN. They are part of the ARISS team and run the Hawaiian ISS telebridge station.

Following the inspection of their station at the Sacred Heart Academy, we had an enjoyable lunch together after which Nancy drove me back to our hotel to join the others. We all relaxed around the pool till it was time to make our way to Honolulu Airport for our flight back to Melbourne via Auckland.

Five very tired amateurs arrived in Melbourne around 11:00 am then had to wait half a day to catch our regional flight back to Mt Gambier, which arrived at Mt. Gambier a little after 7:00 pm that night. Kevin had returned to Brisbane from London a couple of days earlier.

Summing up the trip, we all agreed that it was the trip of a life time. The hospitality of everyone in the US and Canada was unbelievable. Apart from the phone, we used IRLP links to keep in touch with amateurs back in the south east of South Australia, and yes the Australian nextG mobile system is compatible with the US and Canadian systems.

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# VK2

## Foundation course for Girl Guides

Tony LaMacchia VK2BTL

The NSW Girl Guides showed interest in bringing Amateur Radio into their courses offered to their girls. Hornsby and Districts Amateur Radio Club (HADARC) was asked to run a pilot course to determine whether it was suitable as a Girl Guide training module in their activities program. The Hornsby club was keen to run the course, as some of their family members were involved with the Guide movement.

The course was run as a normal two-day Foundation Licence class by Peter Tolmie VK2ZPT with assistance from Tony Farrow VK2AJF and Tony LaMacchia VK2BTL.

Six Girl Guides attended at the Waitara Girl Guide Hall on the 14th and 15th June, with two of them coming from Maitland. Peter's presentation of the material was excellent and presented with such clarity that the candidates appreciated his time and effort in making sure each subject was clearly understood. The youngest candidate was ten year old Leah McNamara who inspired us with her determination to pass. It seemed that the older candidates were more nervous than the younger one but the smiling faces and sighs of relief said it all when they were told that they had all successfully completed both theory and practical levels. The two from Maitland are planning to help with JOTA later this year.

The six successful Girl Guides.

RoseMarie LaMacchia (now VK2FRLM), the Waitara Girl Guide Leader, reported back to NSW Girl Guides of the success of the weekend. They are now planning to hold it as one of their courses offered to girls at the Glengarry Training Property, North Turramurra, using the HADARC Training Team as teachers. **ar**

# VK6

Keith Bainbridge VK6XH

Another month has come and gone, I have only just received my copy of the August issue and now the September one is upon me.

## Hills Amateur Radio Group news

The Hills Amateur Radio Group (Inc.) held its Annual General Meeting on 26 July 2008. The following office bearers were elected:

President Mick Crowley VK6YXL
Vice Pres. Geoff White VK6NX
Secretary Richard Grocott VK6BMW
Treasurer Allan Wood VK6ANT
QSL Manager Graham Rogers VK6RO
Shack Manager
Craig Adams VK6ACA
Social & Contest Coordinators
Marty Martin VK6FDX and
Martin Stretton VK6ZMS

The annual reports were presented, and members will look forward to a continuation of the revitalisation of HARG in 2008-2009.

The VHF Group meeting for July had a very interesting presentation by Phil VK6APH. For those not in the know, Phil is our VK expert on HPSDR, or high performance software defined radio and a columnist in the RSGB's RadCom magazine, with Steve VK6VZ, on this subject. He reproduced the presentation he had given at Dayton this year for members and I for one finally understand how the principle actually works. He also gave an insight to the full HPSDR project and the amazing performance possible with this latest set of boards that can be combined into a true top end transceiver. This aspect of the hobby is advancing at a tremendous rate and I personally feel that the time is not too far off before all radios will be using this technology, not just the few top end transceivers that are currently available.

Now, from Neil VK6NE, the VK6 QSL manager.

Where are my bureau cards? Well they are certainly not in the VK6 QSL bureau. The delivery of cards from overseas has been dismal.

Here is a run down for the last three months, and remember that the quantity as quoted has to be spread over the membership using the buro:

May - VR2, 10; LZ, 31; EI, 13; PA/ON, 130; UA, 330; VE, 20; YO, 12.

June - SP, 280; HL, 65; YO, 65; UT,

16; HL, 385; UT, 16; OZ, 35.

July - PY, 14; EA, 280; 9M, 3; YL, 28; PA/ON, 50; DL, 640.

Notice that no cards have been received recently from the big societies. There was a delivery from W in January 2008, as there was from JA, and from both G and I in April. And so on. Received from SV was a package of 600 cards, the first since June 2005. Some cards were five years old! Another package from XE was the first since August 2006, with some cards eight years old. Now that is really slow bureau operation.

No wonder amateurs are sending QSLs by direct mail! And people complain that VKs are terrible QSLers!

## Hamfest

The NCRG Hamfest was a huge success with an attendance figure close to 400 and a great show of support from the traders present. Unlike the other states, we only have one hamfest per year in the west, so it has to be a good one.

The organisation of the event by the Northern Corridor Radio Group once again excelled, with many commenting for days afterwards that it had been the best ever.

Just to give you an idea of the prizes that were won, how is this for a $2 ticket? Yaesu FT-7800, Icom IC-V82 handheld, Bushcomm Mobile HF vertical, Quansheng UHF handheld, Vibroplex Mini Morse key, 23 cm beam and a soldering station. A full report will follow shortly.

## WARG

The WA Repeater Group (WARG), at its last meeting, had a special meeting to resolve the insurance issues facing all incorporated groups in WA.

We decided many years ago to insure our members for personal injury when taking part in organised events such as placing antennas on towers. This is outside the cover provided by the WIA and it recently expired. WARG have graciously paid the premium for all the incorporated groups and will invoice them based on a financial member status. To the groups in the state who are not incorporated and wish to be involved in this policy and the other benefits available to incorporated groups, I suggest you look into it as soon as possible. It opens doors for possible grants from the Lotteries Commission, for example, but note they are only available if you are incorporated.

I am writing this a few days before the annual rat race, sorry, RD contest. Hopefully there will have been a big turn out around the state as usual and we will be in the winner's chair once again. I would like to hope there will be some propagation on HF as well.

I received an email from Chris Lord VK6BHI relating to the Astronomy display at the Hamfest this year. Regarding Radio Astronomy, have you had a look at the West Australian Radio Observatory web site: http://members.westnet.com.au/waro/ ? I have been out to their premises at Chittering a few times and have spoken to Mike Handley, their Technical Director, about the possibility of using their nine metre dish for EME experiments. They are a small group and would welcome more interest in, and support for, radio astronomy.

I am sure there are many like Chris who would be interested in the activities above and, if so, contact me and I will put you in touch. I do know Al VK6ZAY is involved in radio astronomy and I believe there are others interested in moonbounce around the state as well.

A view of some of the action at the NCRG Hamfest.

## Now to D-STAR

And what is happening in the west.

Tonight I spent a few hours up at the D-STAR site working on the gateway and 23 cm. I did several tests to VK3RWN and VK3JFK with 5/9 reports. At this stage, only a select few will be registered on the gateway as we have some more testing to do. Once this testing is complete, registration will be open as it is at other D-STAR gateways.

23 cm DD is now up and operational also. It is unfortunate that I have no one here in Perth to do any high speed Digital Data links with, however via the Gateway I can connect to any ID-1 in the world so I now do not feel so alone! Hurry up VK6NOW and VK6ZMS, I am waiting! I will most likely be doing some 23cm.

2 m D-STAR is still operational on 146.8375 (-600), however this will only be whilst I am on site (weekends and so on), so keep monitoring it. Whilst the D-STAR repeaters are off the air, there is still plenty of activity on the Si.

Please ensure your settings are as follows:

MYCALL: VK6xxx(insert your suffix)
URCALL: CQCQCQ
RPT1: VK6RWN C
RPT2: VK6RWN G

If your settings are always set to this, you will be able to speak on the repeater and access the gateway. The D-STAR repeaters should be up again all weekend so please feel free to do some signal/propagation tests.

**Heath VK6TWO/VK3TWO**
VK6 D-STAR co-ordinator.

Things are happening!

I would like to thank all those here in VK6 who have taken the time to contact me regarding the VK6 notes, it makes it all worthwhile. That is it from the west for this month, good luck and good DX to you all.

I am waiting for your input! 73

ar

# News from

# VK3

**Jim Linton VK3PC**
Website: www.amateurradio.com.au
Email: arv@amateurradio.com.au

## Radio active national parks

Details and rules for the Keith Roget Memorial National Parks Award have now been posted on the Awards section of the Amateur Radio Victoria website.

Already there is a level of interest in this operating award that encourages portable operation in Victoria's 40 National Parks. Individuals, groups and clubs are talking about going portable in their local National Park.

Chris Chapman VK3QB, Award Manager has initiatives planned that will help promote the award and facilitate those seeking to activate a park or chase such activations. An online notification of intended activations is also set up.

A full list of the National Parks, a map showing their distribution throughout the state, the rules and a set of printable optional log sheets are also available.

A grandfather provision in the rules recognizes the award's history, dating back to circa 1971. Holders of the initial WIA Victoria National Parks Award or the earlier Keith Roget Memorial National Parks Award can claim them as a credit towards the new award.

## RadioFest 2009

The Centre Victoria RadioFest No. 3 will be held at the Kyneton racecourse on Sunday 15 February, 2009.

Over the next couple of months the latest news and developments about this major event will be on the website radiofest.amateurradio.com.au

The organising committee has representatives from Amateur Radio Victoria and the Central Goldfields Amateur Radio Club.

For inquiries email radiofest@amateurradio.com.au, mail address Box 6296, White Hills 3550, Fax: (03) 5442 8025 Phone: (03) 5442 8022.

## Broadcast invitation

In response to an invitation from the WIA Broadcast Producer Graham Kemp VK4BB, the weekly VK1WIA Sunday broadcast on 14 September will be the product of Amateur Radio Victoria.

Members involved in this project include four announcers on the former WIA Victoria VK3BWI broadcasts, so in some aspects it will be an on air reunion or encore broadcast for them.

The aim of the project is to put together a 30 minute broadcast of the standard and style set by VK1WIA while also having scope to do some things differently.

There is a rich heritage of amateur broadcasts in Australia dating back to 1921. Prior to the formation of WIA National in 2004, there were six state based broadcasts and some of these continue today serving mainly local requirements.

The weekly broadcast is an integral part of amateur radio in Australia and a primary means of getting information out to radio amateurs.

If you are not a regular VK1WIA listener but can tune in Sunday 14 September then please do so. Comments on this project broadcast will be welcomed either via the callbacks or email.

## Membership renewals

Membership renewal notices up until October this year have now been posted to members.

Thank you to those who have already responded to their renewal notices issued earlier this year. A special mention of our Amateur Radio Victoria office volunteers who have efficiently dealt with the hundreds of the two-year membership renewals.

Membership of the state-wide organisation costs $30 Full or Associate and $25 Concession, for two years. New members are most welcome and an application form can be found on our website or posted out on request.

## Foundation class

The next weekend training and assessment sessions for the Foundation Licence will be 20/21 September. Enrolments close very soon. For inquiries or to enrol contact Barry Robinson VK3JBR 0428 516 001or arv@amateurradio.com.au

## Warm winter tales from the EMDRC

Winter at the Eastern and Mountain District Radio Club seem to be the time for frenzied activity on every front.

Whether it is contesting, socializing or playing radio, the outside temperature seems to have little or no effect on our enthusiastic members.

The start of July saw the new committee get into gear under the able guidance of our newly elected President Harry Kraehenbuehl VK3KBA.

Around the same time was the presentation on the workings of the Australian Synchrotron by Michael Roberts Senior Education Officer of Monash University's Science Centre. The event was a huge success.

Then came Greg VK3FUNK our 'funky man' who delivered a most informative and professional presentation about St John Ambulance to the members of the EMDRC at their July coffee shop meeting.

Greg works as a volunteer in the St John communications department and his talk covered pretty much all aspects of the St John operation before focusing on the details of the comms centre.

It would be fair to say that most who attended went away with a much deeper appreciation and understanding of the community services that St John provides and some will be considering taking up the opportunity that Greg put out, to join the St John team as a volunteer communications officer.

The rest of July was filled with a visit to the GGREC Hamfest and lots of hot beverages to keep warm in the shack. And just when we thought that the winter momentum was lost, along came another edge-of-the seat presentation at the 1st August meeting.

The subject this time was Infrared Thermography.

*continues over*

## News from

What is Infrared Thermography? I hear you ask.

Well...What is worn under a Scotsman's kilt? Or...what does Ross Gardner VK3UB wear under his skirt?

All was revealed at the August meeting when guest speaker Roger Christiansz,of FLIR Systems Australia Pty. Ltd., gave a most interesting presentation on a stunning technology, Infrared Thermography.

Infrared Thermography is the technique for producing an image of invisible (to our eyes) infrared light emitted by objects due to their thermal condition.

A typical thermography camera looks similar to a camcorder and produces a live TV picture of heat radiation. Sophisticated cameras can actually measure the temperatures of any object or surface in the image and produce false colour images that make interpretation of thermal patterns easier.

The image produced by an infrared camera is called a thermogram or sometimes a thermograph. Roger's presentation covered both the technical operation and practical applications of this amazing technology. The looks on some of the faces in the room told the rest of the story!

As if to drive home the point that the EMDRC folks know how to keep warm in winter, a room full of people attended the winter luncheon at the Mountain View Hotel a couple of days later.

Our spy-cams located outside the venue recorded their attendance at 12 noon and then showed no activity up to 4 pm indicating that it was a long and fulfilling lunch!

The rest of August will have seen us participate in the RD contest and made ourselves heard at the ILLW. Some members may even manage QSOs with special event stations of Beijing 2008 while others will be gearing up for the ALARA Contest at the end of the month. Foundation classes and CW sessions continue, as does the club's telescopic Porta-Mast project to be completed shortly. It will be followed by the Diplexer project.

What a year this is shaping up to be!

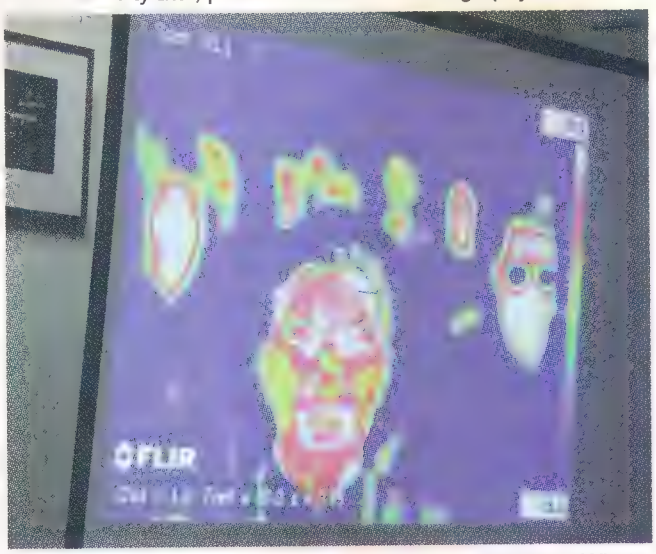
**www.emdrc.com.au email - vk3er@emdrc.com.au**

Contributors:

**Robert Broomhead VK3KRB Joe Chakravartti VK3FJBC**

Photos by Robert Broomhead VK3KRB

Roger Christiansz, Managing Director FLIR Systems Australia Pty Ltd., presents Infrared Thermography.




Infrared Thermography in action...is that you Charles...What happened to you??


**BARG**

**Ballarat Amateur Radio Group**

**HAMVENTION**

**Great Southern Woolshed, Ballarat**

**SUNDAY 26th OCTOBER 2008 10am**

**(NOTE ADVANCED DATE)**

**Trestles Available Booking Essential**

**Roger VK3ADE**

**03 5330 3081 hamvention@barg.org.au**

**S.A.D.A.R.C SHEPPARTON HAMFEST**

**14th Sept 2008 St. Augustine's Church Hall Orr St. Shepparton (usual place)**

New and used amateur and electronic gear for sale by commercial and private traders

Traders access from 8 am, doors open to public at 10 am.

Entry fee $5. Children under 15 free. Trestles $10.

Early bookings would be appreciated.

Contact Daryl Hitchcock VK3KL phone 03 58711444, or e-mail: churr@netspace.net.au

Food available as usual on site.

Call club 2 m repeater VK3RGV 146.650 MHz for directions

# The Geelong Amateur Radio Club – The GARC

Tony Collis VK3JGC

## The Ionosphere

At a moment's notice, Chas VK3PY gave an impromptu and absorbing presentation on the above topic with an accompanying slide show. The talk lasted for nearly 2 hours and drew on material from the Australian Government IPS Radio and Space Services and other sites.

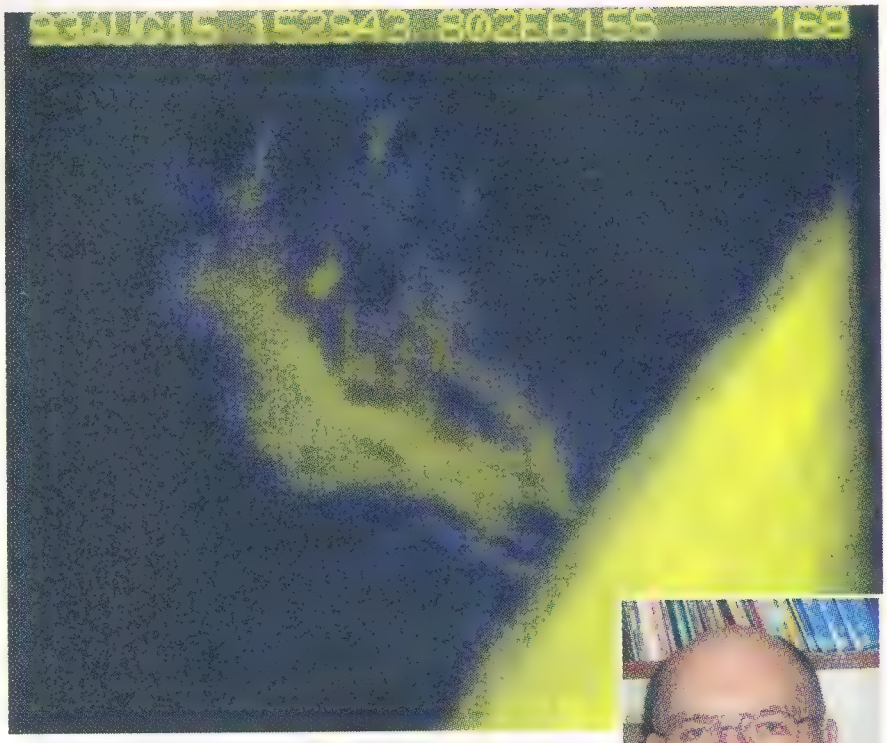
The IPS information in particular encompassed a large number of factors that explained clearly the attributes of the various ionospheric layers and their impact on the RF spectrum during the day and night time.

The solar cycle varies over a period of typically 10 to 11 years from trough to peak and then back to another low point. The conventional index of the cycle is known as the sunspot number which is defined from observations of the sun by optical telescopes. This index can be defined on a daily basis but is more normally averaged over a month or a year. The yearly average is mostly used as an indicator of the progress of the solar cycle we are slowly exiting.

Of particular interest was the double peak of solar activity during the sun's 11 year cycle and the manner in which radio communications are distorted in the presence of an Aurora; this was illustrated by actual recordings of QSOs when this phenomenon was present.

One of the more impressive illustrations provided by Chas was the time lapse photography from a satellite monitoring the sun's corona over several days, showing the extreme violence of the eruptions. Ejections of material from the sun may follow these solar flares and if the material reaches the earth, it can produce magnetic and ionospheric disturbances with consequences for our HF communications, geomagnetic surveys for minerals, the operation of long pipelines and power lines; as happened in Canada when one such burst caused widespread blackouts as well as a host of other effects.

Also covered was the use by the Australian Government of ionosondes. An ionosonde transmits a signal vertically and records all reflections - it is basically a radar for scanning the ionosphere. The highest frequency reflected back from the ionosphere is usually written as foF2, the F region critical frequency, and relates to the MUF for the circuit.



A flare taken in the USA in 1993, at right Chas VK3PY

## Sleep apnoea

As a complete contrast to the ionosphere talk, Gavan Byrne from Melbourne CPAP Services gave an illustrated talk on sleep apnoea and the complications that arise for sufferers. Gavan explained that people with sleep apnoea snore loudly and have restless sleep.

Often these symptoms are not noticed by the person with sleep apnoea but by the partner, who may also notice frequent pauses in breathing and snoring lasting between 10 seconds and a minute. Each pause ends with a very deep gasping or snoring noise and a brief awakening as the person struggles to breathe.

Several GARC members could directly relate to the symptoms that Gavan identified but in the main asserted that it was their wives that had the problem not them! This was a very well received presentation with most of the 'mature' members availing themselves of the leaflets provided.

## GARC Supported Repeaters and Beacons

Ken VK3NW confirms that all repeaters and beacons are operational and working properly. Peter VK3ZAV confirmed that the VK3RGC repeater has been selected for IRLP operation and will be available in due course.

On July 6, the main club repeater VK3RGL went to CTCSS on 91.5 Hz.

## Training

Currently there are five new members preparing for their F call examinations and a number of existing club members with F calls progressing towards their standard licences.

ar

# News from

# VK5

Christine Taylor VK5CTY

## Adelaide Hills Amateur Radio Society

It has been a busy month for AHARS. An assessment event for six students was held on the second weekend of July. All passed: a very satisfactory result.

A number of our members were radio operators for the Coppers' Rally of South Australia (ROSA) in the Mount Crawford Forest two weeks later. They had a very cold, damp weekend but also enjoyed using our hobby to add to the safety of the cars and spectators. It was another valuable opportunity to operate in a mobile, self-sufficient sense.

Amateurs are very proud of the fact that we often provide important emergency assistance in the event of a disaster anywhere in the world.

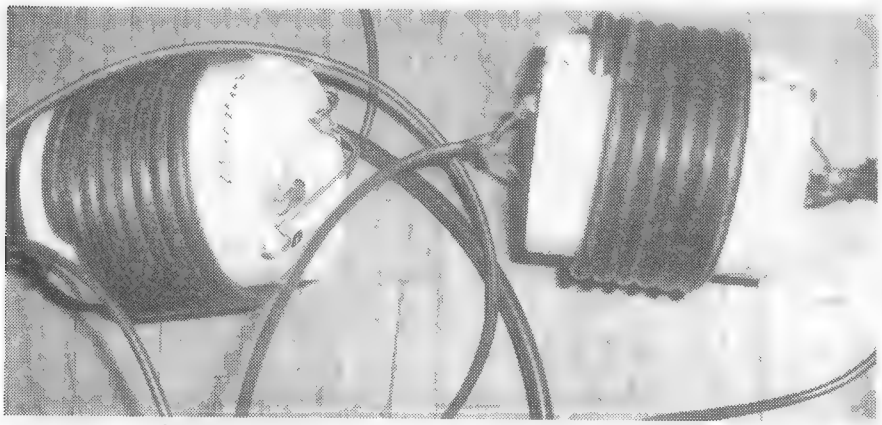
Our monthly meeting in July was a particularly interesting one. Eight or nine different members showed and talked about a project they have recently completed. For a full set of photographs of the offerings go to our website, listed on the WIA website under Clubs.

With the ROSA so soon after the meeting, the first of the member's projects was of particular interest. John VK5EMI has converted one of the multi-compartment hobby boxes on wheels into a portable radio station. He was tired of carrying four or five separate boxes out of the car to his operating station whenever he participated in events such as the ROSA. The box provides him with a battery operated radio and lighted recording table.

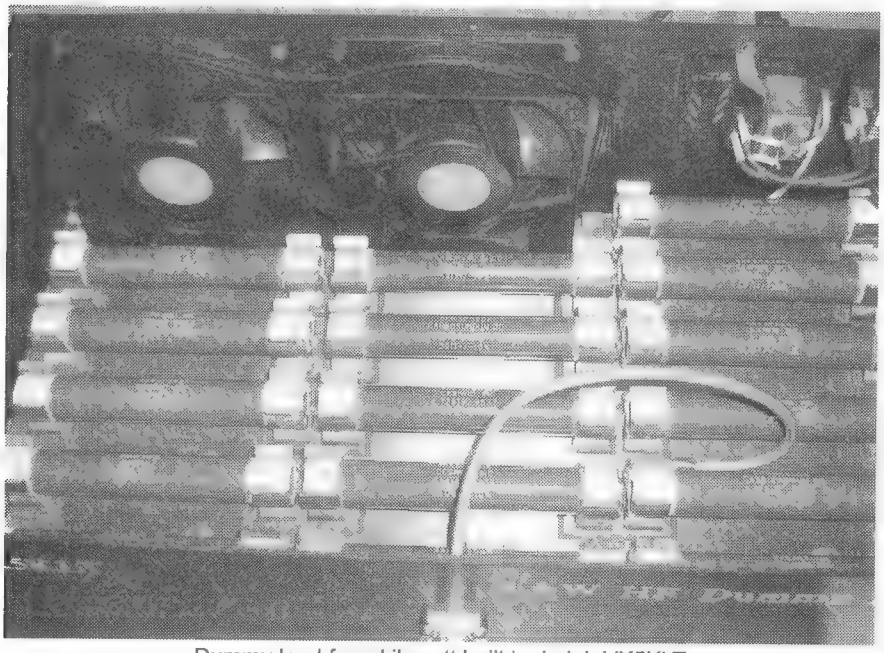
There were several technical ideas, including a "over" timer to use for repeater operation made by Keith VK5OQ, a superhet transceiver from George VK5ZG, a filter for a valve amplifier by Dean VK5LB and a high voltage filter shown by Darryl VK5ZJS. Leigh VK5KLT showed us a dummy load capable of managing a kilowatt without problems, Jim VK5JST had a sine wave generator to show, and VK5RG showed us a replacement power supply from Heathkit that was still available.

Hans VK5YX had brought along his second K2 Elecraft (he made one of these from the kit several years ago and, after using it for a while with great results, decided to sell it, and then regretted that he had done so). Hans gave us a very interesting lecture, with photos, some time ago, about the building of the first one and this one was as immaculate as the first.

There were several less technical but equally interesting devices shown by other members. Barry VK5ZBQ demonstrated how to make your own ladder line; Lyle VK5XNB had a light, portable aerial made of light weight coax with traps wound in different sized short pieces of plastic pipe, and

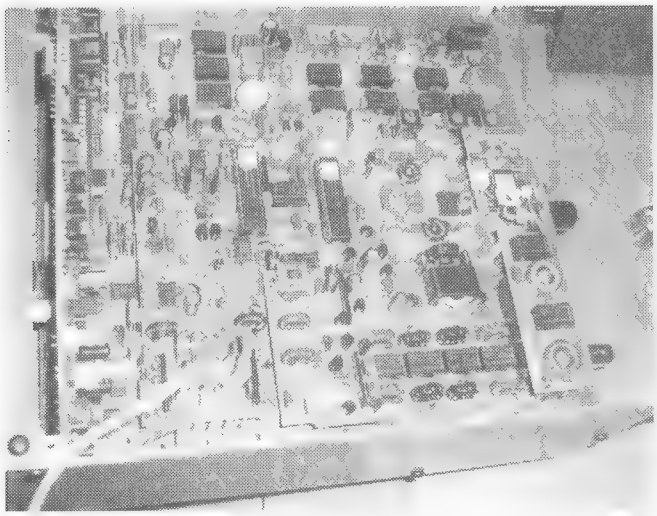


Simple traps for 40 and 30 metres built by Lyle VK5XNB



Dummy load for a kilowatt built by Leigh VK5KLT

John VK5EMI's travelling radio box



A view inside the Elecraft K2 transceiver built by Hans VK5YX

Steve VK5AIM showed off the demountable Yagi used to demonstrate these aerials showing the effect of reflector and director elements and how spacing is also important.

All in all a very varied and interesting Show and Tell.

AHARS followed that meeting with the mid-year dinner a couple of nights later. This was pronounced a success and enjoyed by all


**Radio Amateurs Old Timers Club of SA**

**Annual luncheon Thursday 23 October 2008**
(12 noon for 12:30 lunch). (Please bring your Seniors Card.)

**Marion Hotel, Marion Road, Mitchell Park**

**Public transport Bus M44, Stop 24**

RSVP to one of the following committee members before 20 October 2008:
Secretary: Ray Deane VK5RK. Phone: 8271 5401
Assistant Sec.: Ron Coat VK5RV. Phone 8296 6681

**Ray Deane, Honorary Secretary**

**AHARS Buy and Sell**

**SUNDAY 9th November**

**New Venue Goodwood Community Centre, Rosa Street off Goodwood Road**

**Doors open 9.30. ALARA food and drink plus Barbecue lunch**

**BIGGER AND BETTER THIS YEAR** *Come and meet all your friends*


## A special luncheon in VK5

The formation of the new WIA has been a marvellous change but, in VK5 amateurs have missed the regular meetings of people from all clubs, so Paul VK5PH decided we needed a group gathering.

He organised it as a luncheon at the Mount Osmond Golf Course. This is just out of the city off the South Eastern Freeway, so it is relatively central.

A Sunday was chosen and members of all the clubs were personally invited by Paul. He attended meetings all over the city to urge everyone to participate and to bring their wives and families.

On the day 80 people sat down to a marvellous meal served smorgasbord style so you could go back for seconds if you wished. All who stopped either before or after the meal to look at the view were swept away. The restaurant is on the top of Mount Osmond with almost 180 degree views, and an expanse of green of the golf course as a contrast.

Paul was determined that we were not going to stay sitting at the same table talking to the same people all the time, so he had designed a crossword about us all. Many of the answers were callsigns but some were names. To find all the answers we had to get up and go to other tables to ask:

"Is this you?", and "What is your callsign so I can fill in these boxes?

It is doubtful if anyone filled all the boxes but it served its purpose to get us moving around and meeting people. We never did find all the answers on the day but they have been posted on the AHARS website.

One story heard that day was about a very young YL amateur, Laura VK5FLKM, ex VK2FLKM, who participated in the fox-hunts at the SERG Convention with considerable success. She was third in the mobile competition and did almost as well in the pedestrian mobile.

Laura VK5FLKM with Robin VK5ZAT and sister Miranda.

At age 11, that is remarkable. Lauren would love to find a VK5 club who runs fox hunts but so far has not found one. Laura's OM is Robin VK5ZAT and they live in the Hills. Robin is a driver so unfortunately they cannot often attend club meetings but maybe someday that will change. Laura also has a younger sister Miranda who may one day join Laura as an amateur.

Laura's callsign filled some of the boxes in the crossword!

Paul had some Icom radios and Icom caps to give away as prizes, as well as a number of other gifts. The gathering was amused to see that, despite many different ways to choose winners, everybody at one particular table won a prize!!

Chance is a strange bedfellow. **ar**

# News from

# VK7

**Justin Giles-Clark, VK7TW**
Email: vk7tw@wia.org.au Regional Web Site: reast.asn.au

## New 13 cm World EME Record

Congratulations to Rex VK7MO, who was ably assisted by Eric VK7TAS. who on 27 July broke the world 13 cm Earth Moon Earth record twice in one session! Details can be found in the VHF/UHF section of this magazine.

## National ALARA Meet 2008

As you read this the 9th ALARA National ALARA Meet 2008 in Ulverstone will almost be underway. It also celebrates 33 years of ALARA. At the time of writing there were already 70-80 people booked from all over the place. Susan Brain VK7LUV is the coordinator of the Meet and can be contacted on vk7luv_susan@yahoo.com.au. I hope to see you there.

## NW Tasmania Amateur Radio Interest Group

The August meeting was very well attended. After a short business meeting there was a presentation by Rex VK7MO and Justin VK7TW on their over the horizon optical communications experimentation. The talk was well received and many questions were answered along with discussion about possible locations for the Bass Strait contact using the technology sometime in the future. Stay tuned!

Tony VK7AX has added three new amateur radio podcasts to his nightly broadcasts schedule. These include "Practical Amateur Radio", "Resonant Frequency" and "ICQ". For more details about these broadcasts please take a look at: http://203.24.120.3/spectrum/

## Northern Tasmania Amateur Radio Club

The August NTARC BBQ meeting night at the Mount Barrow interpretation centre went very well. The fire was stoked up, the food and drink flowed and of course the company was second to none!

The event was declared a great success. We welcome Kevin Warrick VK7FKAW to the bands. Kevin is harmonic of Bryn VK7FBAW so, stay tuned in the North for this new callsign. Peter VK7PD would like to know if anyone would be interested in attending classes to upgrade their licence to Advanced, or maybe Standard level. Contact Peter on 6331 7761 or Al VK7AN on 0417 353 310 if you are interested.

## Radio and Electronics Association of Southern Tasmania

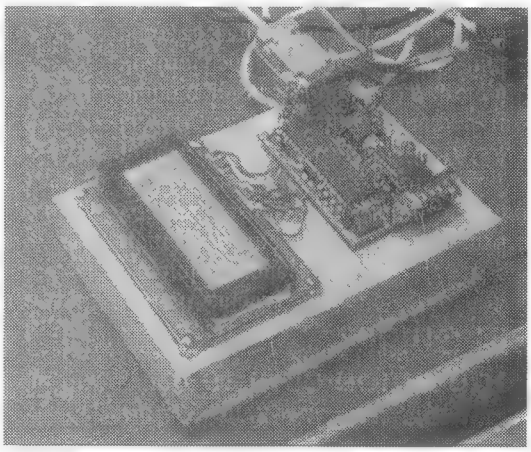
Welcome to three new Foundation Licensees, Brett VK7FMMM, Warren VK7FEET and Shane VK7FOOT. Brett and Warren have already been heard on repeater VK7RAD/RHT. Welcome to the airwaves.

Danny VK7HDM gave the August presentation on the packet radio systems that he runs from his home QTH. This comprehensive and complex system makes available many packet applications including TNOS, Xrouter, DXSpider, packet BBS, Telnet, AXIP, AXUPD, WWW, FTP, Chat, Converse, SMTP/POP3 Mail services and of course packet radio! This was a great talk, thanks Danny.

Scott VK7HSE also brought along and described his beta version of the TinyTrak4 packet modem which he helped the developer debug recently. A very impressive device and cheap for what it can do! Thanks Scott.

## WICEN Tasmania (South)

August was busy for the WICEN South team. The team provided safety checkpoint radio communications for the Southern Endurance Riders.(See story next page). The next weekend they operated in the ILLW and RD Contest at the Cape Bruny Lighthouse and then August 30 was their AGM at the Brookfield Winery, Margate.



Scott VK7HSE's TinyTrak4 beta modem displaying APRS traffic

Danny VK7HDM describing his packet radio configuration.

Christine Taylor VK5CTY

# Did you participate in ALARA's birthday?

The Birthday Net on Saturday 26th July was extremely well patronised with 13 members on at one time or another during the hour of the Net. It was fun to wish each newcomer "Happy Birthday".

The net was notable for the many people calling in from 'out of home state's. Marilyn VK3DMS and Jenny VK5ANW had exchanged states, which added to the pleasure of the unusually good propagation conditions.

## The birthday luncheons

The earliest birthday luncheon was held in VK4 by the Gold Coast group, with 12 YLs present. A dozen met at Melbourne's Southbank, and eleven enjoyed each other's company at the Morphett Arms in Adelaide. VK6 will hold the last Birthday luncheon on their regular Thursday in September.

Within ALARA and other YL groups, we exchange the greeting "33" instead of "73" or "88", exchanged between amateurs worldwide, as this was the 33rd year for ALARA was recognised at each of the special luncheons.

Those of us who live in cities with enough numbers to have regular lunches are fortunate. All welcome visitors from interstate if they are there on lunch day and can sometimes arrange lunches if they are there at another time.

The two VKthrives attended the Birthday lunches in the visited states, which in VK5 meant that, unusually, the President and the two Vice-Presidents were at the same venue.

There were also two of the ALARA dolls, VK5GAL and VK3GYL, present. I wonder if they (and others) will be at the ALARAMEET in Ulverstone? They make an interesting addition.

## By the time you read this....

You will have participated in the RD Contest, and the ALARA Contest and already be in Tasmania joining in the ALARAMEET. WOW!

I hope joined in both contests and have sent in your logs. Sending off those logs matters because every Contest Manager remarks that more callsigns were heard than logs submitted. It is a shame not to join in all the way.

Remember to apply for the ALARA Award, too. Look back at this column in last month's issue to find the conditions. It really is a most attractive award to add to (or to start) your Brag Wall.

## The 222 net

At 0500 Zulu – the middle of the afternoon for us – is the time to tune in to the YL NET on 14.222 MHz. Some of the overseas YLs are there, usually including a number of ZL girls.

The Net is being run very efficiently by Lesley VK5HLS – who is working her way towards her DXCC. June VK4JS wandering in VK6 is often heard. June is well known on the air for her DX exploits, being one of the rare DX operators to hold a Worked All Counties (in the US). Recently there have been some ZS calls heard, as we near the next YL International Meet in South Africa.

Propagation conditions seem to be improving. We seem to have been at the bottom of the current sunspot cycle for a long time. Now is the time to start to look for those DX stations.

## The Traveller's Net

If you area newish licencee, you may not know about the Traveller's Net run by and for amateurs travelling in VK.

Each day, at 1200 EST, there is a net run from VK6 on 14.116 MHz for the benefit of amateurs. The OMs who run the net start listening about half an hour before the official start.

If you are travelling you will want to stop for lunch, so if you make the stop between about 1130 EST and 1300 EST, tune up your rig and let others know where you are located.

Mostly the net is used for that purpose. You call in and say where you are and where you intend to 'overnight' or stay anywhere for longer. If you want to know where anyone else is, the OMs list the people who have called in early and say where they are at the time.

At the official beginning of the net there is always a call for any emergency or urgent stations, someone will be listening on that frequency to help you out. Several stations around Australia listen in every day and will act as relays for those that cannot be heard in VK6, so you are never out of touch.

If you want to speak to someone you call in and nominate a frequency then you both move to that spot and leave the net frequency clear for others.

Any messages for another amateur or to or for your family can be dealt with.

It is a marvellous service run by amateurs for the benefit of amateurs. It is also interesting to just listen in to. You hear about places you never knew existed or maybe places you have heard of but have not got to yet. It makes for good lunchtime entertainment!

June VK4SJ and Maria VK5BMT have been heard travelling somewhere in the North where it is warm. ar

The gathering at one of the birthday lunches. VK5GAL and VK3GYL at centre front.

# WICEN Tasmania (South) goes Horseback

Roger Nichols VK7ARN

WICEN has provided communications support for Southern Tasmanian Endurance Riders (STER) events for the past three years. Initially involvement was confined to rides in the Wielangta Forest, south of Orford on Tasmania's East Coast. Lately the team has been involved in each of the four annual rides each at a different location.

In August we returned to Wielangta's familiar area, so another dimension was proposed to STER President and ride organiser Ossie Owens. Would one of the riders carry a backpack APRS tracker unit? Ossie came to the party and found us a "willing" and, as it turned out, a winning rider.

The tracker unit, made up of a Byonics TinyTrak 3 Plus, SiRF 3 GPS and a Puxing handheld radio, was packed into a stripped out backpack rehydration unit. (They used to be called water carriers, but these days, we rehydrate, not drink). The GPS was Velcroed to one shoulder strap and a 'rubber ducky' antenna attached to a bracket providing an antenna mount via the drinking tube hole on the other shoulder strap. A 1.3 amp hour SLA battery powered the Tracker and GPS; overkill but a nice fit in the bag. The standard lithium ion battery looked after the radio. Earlier problems were overcome by wrapping the Tiny Tracker in aluminium foil, ferrite on all cables and wads of foil around the antenna mounting bracket, made up from scraps of aluminium fabricated to sit firmly in the bag. Total mass was 1.7 kilograms.

The project had multiple purposes. One, to give us something interesting to do; two, to give the waiting supporters (mainly parents and partners) something interesting to look at, and last but not least, to show how clever we are. (It is taking a long time to get our horsey friends to stop calling us the CBers!)

All the WICEN vehicles carried APRS trackers to enable them to be guided from the Base to their checkpoint locations. On the ground checks confirmed indications gained from the Radio Mobile propagation and mapping software. Voice comms between Base and the checkpoints was easy with normal mobile 2 m gear, so the Base 12 metre telescopic mast and antenna was devoted to APRS. To ensure good coverage around the course, a digipeater was set up on an accessible hill top. The display medium was a 17 inch (43 cm) notebook PC running AGW Packet Engine Pro and AGWTracker, USB linked via an Elcom micro TNT to an Icom IC-208H. All mounted on an eye level shelf on the WICEN trailer and powered by Honda to complete the PR picture.

The rider encountered the only problem a constant tapping on her helmet by the antenna. This was fixed for the second circuit by adjusting the bracket to give 45 degree polarisation and helmet clearance.

The tracking was perfect around the two 40 kilometre circuits of the course, 80 kilometres in total. Being able to see the speeds travelled on the varying topography, ranging from flat paddocks, through steep rocky tracks to soft beach sand was a bonus in the "We are not CBers" stakes! To top it all off, our horse came in first!

Roger VK7ARN
Operations Coordinator
WICEN Tas. (South)

**ar**

The tracker unit on Janine Parr's back, who in turn is on Madam Pandora, a pure bred Arab mare and a winner.

Chris VK7FCDW (left) and Roger VK7ARN (right) working hard at Base

## New building block for microwaves

*PLL-stabilized Crystal Oscillator for 12 GHz*

Kuhne have sent information on how an external 10 MHz reference frequency can be connected to achieve highest frequency accuracy. This is necessary for EME, WSJT and Tropo DX. The frequency of 10 MHz can be supplied by a highly stable OCXO, a reference oscillator of a frequency counter, a rubidium frequency standard or a GPS controlled frequency source.

If a 10 MHz reference frequency is not available, the internal crystal oscillator of the unit can be used. This crystal oscillator is frequency stabilized by a 40°C precision crystal heater QH 40 A.

**Features**

- Fixed frequency PLL-stabilized crystal oscillator
- Internal temperature stabilized crystal oscillator with QH 40 A
- Input for external 10 MHz reference frequency
- Automatic activation of PLL if external 10 MHz signal is supplied
- Lock Detect status: internal LED
- Over voltage and reverse polarity protection
- Helical filters and microstrip filters for high spurious and harmonic rejection
- Compact construction in a German Silver case

**Specifications**

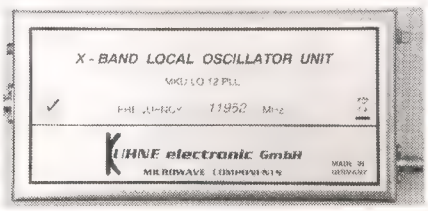
Type MKU LO 12 PLL
Output frequency 11952 MHz (for 24 GHz)
12024 MHz (for 24 GHz USA)
11736 MHz (for 47 GHz)
Output power min. 35 mW
Frequency stability @ 0 ... 40 °C typ. 5 ppm (without 10 MHz reference frequency)
Ext. reference in 10 MHz / 2 ... 10 mW
Supply voltage +12 ... 14 V DC
Current consumption 260 mA
Input connector for 10 MHz SMA-female, 50 ohms
Output connector SMA-female, 50 ohms
Dimensions (mm) 111 x 55 x 30
Case German silver
Weight typ. 140 g

**Accessories**

As a 10 MHz frequency source Kune recommend the GPS-stabilized oscillator by James Miller, G3RUH.

- GPS-stabilized 10 MHz oscillator (James Miller, G3RUH)

More information is available on the company website www.db6nt.de




# Over to you

### Bill Magnusson

I wish to congratulate Bill Magnusson VK3JT for the informative 20 years he has given the amateur radio fraternity writing the AMSAT column for this journal.

It was in 1988, when we were both members of the former RAAF Williams Amateur Radio Club VK3APP, and I was on the Publication Committee that produces AR, that I approached Bill to write an article about amateur satellites for publication in our journal.

In quick time, Bill did not produce one, but a series of articles titled *Getting Started in Amateur Radio Satellites - A Hitch Hikers Guide to the Galaxy*. The series was so well received both locally and internationally that he was the recipient of the coveted Higginbotham Award for 1988. Subsequently of course, he went on to author the AMSAT column, so I accept part of the blame for your infliction, Bill, over the past two decades.

Bill eats, drinks, and sleeps satellites. His knowledge and enthusiasm for all things orbiting is legendary. However his interests do not stop there. I dined with Bill in July, and afterwards over coffee at his home he showed me some of his other radio and non-radio projects he is currently working on. Keep up the good work with that spectrum analyzer application you are using Bill. I look forward to hearing more about it when we catch again up in October!

Writing a regular column like Bill has done for the past 20 years is a monumental task, and is not an achievement to be over looked or taken lightly. Like the many other long-termers that continue to make, and have made, AR the success that it continues to be, Bill has made his mark and quite deservedly hangs up his keyboard to pursue other activities, or perhaps enjoy a well earned break. He might even find time to get on the air and chat to some of his many friends.

Thank you Bill for an enjoyable double decade of reading. Although I am not an active satellite enthusiast, I do have more than a passing interest in them and maybe one day will eventually find the time and enthusiasm to do more than just read about, or listen to them. I have had the privilege of knowing Bill for about as long as he had been writing the AMSAT column, and wish him well for the future.

Bruce R Kendall
VK3WL/9V1WL
Ballan Victoria.

### OTY Cover story August 2008: Spy In A Biscuit Tin

John Nieman finds it odd that although the German Secret Service (the Abwehr) was monitoring radio traffic between England and France, the German forces were slow to react to Overlord.

There is nothing strange about it at all. The Abwehr from the very top to the agents in the field were heavily infiltrated with traitors. Admiral Canaris, the chief of the Abwehr, was a traitor from the very beginning of the war, a key player in the 20 July bomb plot, as was his deputy Colonel Hans Oster.

The intelligence regarding the allied landings was deliberately withheld from the commanders in the field.

Regards
Terry Rumble VK2HGQ


**CELEBRATING BEING LICENSED FOR 10 YEARS?**

***Congratulations!***

**Now you can join the**

**Radio Amateurs Old Timers Club of Australia**

**as an *associate member***

**If you have been licensed more than 25 years then you are invited to join as a *full member* of the RAOTC.**

**In either case a $5.00 joining fee applies. The annual fee is $8.00 or only $15.00 for two years. The Club journal, OTN, is published twice each year and there are monthly news broadcasts. We also guarantee good fellowship.**

Write to
RAOTC,
PO Box 107,
Mentone, VIC., 3194
or call Derek VK3XY on 03 9563 6909
or Bill VK3BR on 03 9584 9512.

**More details of the Club and membership application forms are available from our web site:**

**http//:www.raotc.org.au .**

Phil Smeaton VK4BAA

## Contest Calendar for September — December 2008

| | | | |
|---|---|---|---|
| **September** | **6** | **ARDF Championship (80 m)** | **CW** |
| | 6/7 | All Asia Contest | SSB |
| | 6/7 | RSGB SSB Field Day | SSB |
| | 6/7 | Region 1 Field Day | SSB |
| | 13/14 | Worked All Europe | SSB |
| | 20 | Westlakes Contest (Unconfirmed) | SSB/AM |
| | 20/21 | SRT (Italian) HF Contest | SSB |
| | 27/28 | CQWW RTTY DX Contest | RTTY |
| | **27** | **Old Timers Contest** | **CW/SSB/FM** |
| **October** | **4/5** | **Oceania DX Contest** | **SSB** |
| | **11/12** | **Oceania DX Contest** | **CW** |
| | 18/19 | JARTS WW RTTY | RTTY |
| | 18/19 | Worked All Germany Contest | CW/SSB |
| | 25/26 | CQWW DX Contest | SSB |
| | 25/26 | ARRL International EME Competition | CW/SSB |
| | 25/26 | CQWW SWL Challenge | SSB |
| **November** | 8/9 | Japan Intl. DX Contest | SSB |
| | 8/9 | Worked All Europe DX Contest | RTTY |
| | **15/16** | **Spring VHF/UHF Field Day** | **CW / SSB / FM** |
| | 22/23 | ARRL International EME Contest | All |
| | 29/30 | CQWW DX Contest | CW |
| | 29/30 | CQWW SWL Challenge | CW |
| **Decembe** | 5/7 | ARRL 160 m Contest | CW |
| | 6 | RTTY Melee | RTTY |
| | 13/14 | ARRL 10 Metres Contest | CW/SSB |
| | 20 | OK DX RTTY Contest | RTTY |
| | **26 to 15 Jan 2009** | **Ross Hull Memorial VHF Contest (VHF/UHF)** | **CW / SSB / FM** |

## Welcome to this month's Contest Column.

## CQWW SSB Contest 2007 SSB - VK Only

**VK was very well represented in the contest, with a good spread of entry categories – but nothing in Multi-Multi!**

With the demise of the Westlakes contesting contingent, VK2ATZ might take some time to recover and be again the force that it once was. Alternatives have been arranged and the driving forces behind the rise of VK2ATZ will rise, phoenix style, to do battle again on the bands – but with an alternative callsign by the time this goes to print.

**Plan well ahead**

**Make this year the biggest**

**Ross Hull Contest**

**ever**

## CQWW SSB Contest 2007 Results

### SSB - VK Only

| Callsign | Section | Score |
|---|---|---|
| VK4CZ | All Band, HP | 1,291,560 |
| VK4EMM | All Band, HP | 841,340 |
| VK6DXI | All Band, HP | 666,532 |
| VK3TZ | All Band, HP | 603,464 |
| VK2FHN | All Band, HP | 65,340 |
| VK3YXC | All Band, HP | 45,448 |
| VK3AVV | All Band, HP | 45,450 |
| VK1MJ | All Band, HP | 24,985 |
| VK2BCQ | All Band, HP | 24,832 |
| VK3TDX | All Band, HP | 2,992 |
| VK2UZ | 28 | 1,600 |
| VK4AN | 7 | 39,767 |
| VK7WPX | All Band, LP | 34,782 |
| VK5MAV | All Band, LP | 12,110 |
| VK2XF | All Band, LP | 8,400 |
| VK4FJ | All Band, LP | 5,371 |
| VK6CR | All Band, LP | 5,088 |
| VK6LXU | All Band, LP | 3,560 |
| VK2HBG | All Band, LP | 2,914 |
| VK7BEN | All Band, LP | 48 |
| VK3ZGP | All Band, LP | 6 |
| VK4EJ | 21 | 82,646 |
| VK6LW | 14 | 3,640 |
| VK4ZD | All Band, Assisted | 49,536 |
| VK6DU | 14 | 7,800 |
| VK4TI | Multi-Operator, Single Transmitter | 844,806 |
| VK1CC | Multi-Operator Two Transmitter | 2,094,448 |
| VK4WR | Multi-Operator Two Transmitter | 1,733,501 |
| VK6ANC | Multi-Operator Two Transmitter | 377,600 |
| VK2ATZ | Multi-Operator Two Transmitter | 201,951 |
| VK4ATH | QRP | 12,640 |

## CQWW Contesting Records

The organisers of the CQWW contests produce records for each country and for the world as a whole, for both SSB and CW. The record listings tend to be slow in updates, but the latest tables available on the website are shown below.

New entries into the records table shown in bold italics – congratulations to all concerned!

Noted for pounding his brass in the twilight hours, Steve VK6VZ holds the record for 160 m in this contest. Steve has been on the band for quite a number of years and has a considerable antenna system set-up at home. Mike VK6HD is also a veteran of Topband and has held the top slot for a not inconsiderable number of years – since 1985 in fact.

Getting a reasonable signal onto 160 m is no mean feat in itself, but arranging an effective receiving system takes yet more hard work and careful design.

Radials for the inverted 'L' antenna and working 'split' for that juicy DX add a modicum of spice when working the band. And to be effective, 'work' is exactly what it takes as 160 m is not for the easy pickings as such. Noise on receive from Mother Nature tends to be a major limiting factor when trying to grab that elusive DXpedition.

## Table of CQWW CW Records for VK

### L Low Power, Q QRP, A Assisted, MS Multi-Single, MM Multi-Multi

| Category | Call | Score | QSOs | Yr record set |
|---|---|---|---|---|
| All | VK6AA | 5,933,760 | 3822 | 03 |
| 28 | VK8XX | 848,990 | 1969 | 89 |
| 21 | VK4EMM | 886,103 | 2112 | 02 |
| 14 | VK6LW | 1,055,835 | 2236 | 04 |
| 7 | VK6LW | 610,067 | 1753 | 03 |
| 3.5 | VK4EMM | 173,472 | 487 | 06 |
| 1.8 | VK6HD | 12,330 | 97 | 85 |
| | | | | |
| LAll | VK3DXI | 1,867,762 | 1706 | 92 |
| L28 | VK4DX | 638,950 | 1771 | 00 |
| L21 | VK4EMM | 815,850 | 1923 | 00 |
| L14 | VK4DX | 761,634 | 1757 | 01 |
| L7 | VK6LW | 533,696 | 1453 | 92 |
| L3.5 | VK6LW | 83,300 | 346 | 96 |
| L1.8 | VK3TZ | 12 | 2 | 00 |
| | | | | |
| QAll | VK2BAA | 56,810 | 210 | 05 |
| Q28 | No entry recorded | | | |
| Q21 | VK6AA/2 | 378 | 9 | 01 |
| Q14 | VK2BEX | 84,739 | 304 | 91 |
| Q7 | VK2BAA | 240 | 10 | 04 |
| Q3.5 | No entry recorded | | | |
| Q1.8 | No entry recorded | | | |
| | | | | |
| AAll | VK5GN | 1,090,795 | 1662 | 98 |
| ***A28*** | ***VK6DU*** | ***31,776*** | ***272*** | ***06*** |
| ***A21*** | ***VK4AN*** | ***388,926*** | ***1113*** | ***06*** |
| A14 | VK1AA | 921,052 | 1905 | 04 |
| A7 | VK1AA/4 | 437,970 | 1251 | 03 |
| A3.5 | No entry recorded | | | |
| A1.8 | VK6VZ | 7,955 | 79 | 04 |
| | | | | |
| MS | VK6LW | 3,404,906 | 2968 | 90 |
| ***M2*** | ***VK2ATZ*** | ***624,101*** | ***952*** | ***06*** |
| MM | No entry recorded | | | |

Topband is a night time band, so even the location of the station may require some negotiation with family members. You will not be very popular if sleep patterns get an unwelcome interruption or you wake your 'Junior Op' up whilst working a pile-up into NA.

## Getting started on Topband

So, how to get started on the band if the bug has bitten you?

The first thing to do is to get a copy of ON4UN's book "Antennas and Techniques for Low Band DX'ing" and read it from cover to cover. It is considered to be the Bible of Topband and is crammed full with excellent practical designs and advice.

If you have a tower at least 50 feet (15 m) high with a decent sized tribander, you have the makings of a good vertical antenna on 160 meters. You will need to ground mount at least 32 radials - try to make them at least 60 feet long – but 130 feet long is ideal. Some stations feature elevated radials instead of ground mounted, so if you have the real estate to consider this approach, have a search on the Net for the best approach

for your situation. Next, run a wire or "cage" of wires (this effectively increases the bandwidth of the antenna) from the base and then up to the top of the tower and connect them to the tower. Separate the wire (or cage of wires) from the tower about 2-3 feet. You now have a folded unipole (a vertical half of a folded dipole). You can use an "L-network" or an omega match (if the tower resonates above 1.83 MHz) or a gamma match (series capacitor) if the tower resonates below 1.83MHz. Clean the tower with pipe cleaning sand paper and apply some NOALOX aluminium paste to the spot where the wires connect to the tower - hose clamps will work very nicely for this. Build the wire spacers with an insulating material such as electric fence fibre rod or something similar.

Six wires in a "cage" is a simple configuration, running from the matching network (just a 1000pf vacuum variable in series if you are lucky to have a nicely stocked junk box!) in a box at the base up to the 50 foot point on the tower and just connect them directly to the tower.

## A tower? I'd dream of one!

If, like the majority of Hams, you do not have a tower available to you, a tall tree is an excellent alternative. A vertical might still be achievable if you can get a rope over a well placed branch to haul a wire into the air, but you might also be able to erect an inverted 'V' antenna to get onto the band.

Odds are, that the support available to you is likely to be less than a halfwave for the band - 80 m trees are quite a find in a suburban lot for example – so the radiated pattern is going to be omnidirectional even for a dipole. To get you onto the band, this is not an issue as such and there are many stations to work around the globe with such an antenna and 100 watts of RF.

## Chasing Topband DX

Next, it is advisable to put up a receiving antenna. If you have the space a directional Beverage antenna is one of the best and can help to contend with the static crashes. The downside, is that the receive antenna requires a large amount of real estate as 550 feet (168 m) is minimum – but 1100 feet (336 m) is better if you can manage it - and it needs to 'see' in the direction of interest.

A typical direction of interest might be towards North America or possibly Europe. There are smaller receiving antennas such as the EWE, Pennant and Flag which are getting more and more use by Topbanders who do not have lots of real estate – and with some excellent results. There are also plenty of other antenna designs around that will get you onto the band with a smaller footprint – you just need to cut your cloth according to the amount of space that you have available and the desired efficiency of the antenna system.

You might even want to erect a temporary antenna towards an area of interest on the globe for chasing a particular DXpedition, for example. There are a number of radio societies around the world that organise specific contests for 160 m but the CQ Magazine series of contests provide some of the best opportunities for working the world on this fascinating band.

Of course, this has been a very simple introduction into the world of 160 m, but it is a good idea to subscribe to the Topband reflector digest via www.contesting.com/topband. All the "big guns" subscribe with many years of experience and they are very helpful to newcomers. Remember, the only daft question is the one that does not get asked. There are a number of experienced Topband operators on the VKCC reflector also of course!

## CQWW SSB Records for VK

**L Low Power Q QRP A Assisted MS Multi-Single MM Multi-Multi**

| Category | Call | Score | QSOs | YR record set |
|---|---|---|---|---|
| All | VK5GN | 3,709,900 | 2928 | 99 |
| 28 | VK4QK | 859,011 | 2238 | 79 |
| 21 | VK4VU | 1,079,335 | 2609 | 79 |
| 14 | VK6HD | 706,251 | 1483 | 72 |
| 7 | VK6IR | 208,748 | 782 | 84 |
| 3.5 | VK3FY | 100,056 | 449 | 84 |
| 1.8 | VK6HD | 5,363 | 62 | 83 |
| | | | | |
| LAll | AX4EJ (VK4EJ) | 1,203,124 | 2061 | 00 |
| L28 | VK2ARJ | 479,987 | 1601 | 00 |
| L21 | VK5AM | 613,168 | 1578 | 01 |
| L14 | VK4EMM | 667,056 | 1533 | 00 |
| L7 | VK4EMM | 97,836 | 438 | 01 |
| L3.5 | VK3TZ | 105 | 8 | 99 |
| L1.8 | No entry recorded | | | |
| | | | | |
| QAll | VK4WPX | 343,804 | 624 | 01 |
| Q28 | VK4VHY | 26,964 | 153 | 83 |
| Q21 | VK3NDS | 76,380 | 394 | 96 |
| Q14 | VK2BAA | 17,171 | 96 | 05 |
| Q7 | No entry recorded | | | |
| Q3.5 | No entry recorded | | | |
| Q1.8 | No entry recorded | | | |
| | | | | |
| AAll | VK5GN | 1,844,180 | 1841 | 97 |
| A28 | No entry recorded | | | |
| ***A21*** | ***VK4NEF*** | ***54,780*** | ***322*** | ***06*** |
| A14 | VK1AA | 535,248 | 1213 | 05 |
| A7 | VK6DU | 14,805 | 128 | 05 |
| ***A3.5*** | ***VK4AN*** | ***1827*** | ***42*** | ***06*** |
| A1.8 | No entry recorded | | | |
| | | | | |
| MS | VK4UC | 4,961,152 | 3939 | 99 |
| M2 | VK4CZ | 4,126,800 | 3309 | 04 |
| MM | VK4UC | 4,356,970 | 3394 | 06 |

New entries into the records table shown in bold italics – congratulations to all concerned!

As can be seen from the tables, and as per last year's discussion in this journal, there is still plenty of opportunity to set a VK record. Some records have stood for quite some time, such as the SSB Multi-Multi record set by VK2DZZ in 1981 but VK4UC took the crown in 2006 to raise the MM bar by quite a degree. Go on, have a crack at a record!

If you have any contest related material for inclusion within the column, topics that you would like covered or even some experiences and pictures you would like to share, then please feel free to get in touch via vk4baa@wia.org.au. See you on the bands.

73 de VK4BAA Phil Smeaton.

# SPRING VHF-UHF FIELD DAY 2008

**Contest manager: John Martin VK3KM**

## Dates: Saturday and Sunday 15 and 16 November 2008.

**Duration in all call areas other than VK6:** **0100 UTC Saturday to 0100 UTC Sunday.**
**Duration in VK6 only:** **0300 UTC Saturday to 0300 UTC Sunday.**

Please note that the UTC times differ from those of the Winter Field Day because daylight saving time will apply in most states.

## Sections

A: Portable station, single operator, 24 hours.

B: Portable station, single operator, 8 hours.

C: Portable station, multiple operator, 24 hours.

D: Portable station, multiple operator, 8 hours.

E: Home station, 24 hours.

Entrants may enter more than one section.

*Single operator stations:* If a single operator station operates for more than 8 hours, the station may enter both Section A and Section B. If the winner of Section A has also entered Section B, his log will be excluded from Section B.

*Two operators:* If two operators set up a joint station with shared equipment, they may choose to enter Section A or B as separate stations under their own callsigns, or Section C or D under a single callsign. If they enter Section A or B, they may not claim contacts with each other.

*Multi-operator stations:* Stations with more than two operators must enter Section C or D. If the winners of Section C have also entered Section D, their log will be excluded from Section D. Operators of stations in Section C or D may not make contest exchanges using callsigns other than the club or group callsign.

*Operating periods:* Stations entering the 8 hour sections may operate for more than 8 hours – please include details in your cover sheet of which 8 hour period should be used for scoring purposes.

## General Rules

One callsign per station.

Operation may be from any location.

A station is portable only if all of its equipment is transported to a place which is not the normal location of any amateur station.

Stations may change location during the Field Day provided the station is dismantled and reassembled each time it moves. You may work stations within your own locator square. Repeater, satellite and crossband contacts are not permitted.

No contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies must not be used for contest activity. Suggested procedure is to call on .150 on each band, and QSY up to make the contest exchange.

### Contest Exchange

RS (or RST) reports, a serial number, and your four digit Maidenhead locator. The Maidenhead locator is optional if it has already been exchanged in a previous contact during the Field Day and neither station has moved since then.

### Repeat Contacts

Stations may be worked again on each band after three hours.

If the station is moved to a new location in a different locator square, repeat contacts may be made immediately.

If the station moves back into the previous locator square, the three hour limit still applies to stations worked from that square.

### Logs

Logs should cover the entire operating period and include the following for each contact: UTC time; frequency; station worked; serial numbers and locator numbers exchanged.

### Scoring

For each band, score 10 points for each locator square in which your station operates, plus 10 points for each locator square worked, plus 1 point per contact. Multiply the total by the band multiplier as follows:

| 6 m | 2 m | 70 cm | 23 cm | Higher |
|---|---|---|---|---|
| x 1 | x 3 | x 5 | x 8 | x 1 |

Then total the scores for all bands.

### Cover Sheet

The cover sheet should contain the names and callsigns of all operators; postal address; station location and Maidenhead locator; the section(s) entered; the scoring table; and a signed declaration that the contest manager's decision will be accepted as final.

Please use the format shown in the table at below left for your scoring table. In this example the operator has operated from one locator and worked four locators on each band:

A blank cover sheet, with scoring table, is available on the Field Day page of the WIA web site.

### Entries

Paper logs may be posted to

**The Manager, VHF-UHF Field Day,**
**3 Vernal Avenue,**
**Mitcham, VIC 3132.**

Electronic logs can be e-mailed to **vhf-contests@wia.org.au.**

The following log formats are acceptable: ASCII text, MS Office 2000 (or earlier) RTF, DOC, XLS or MDB.

Logs must be received by

**Monday, 3 December 2008.**

Early logs would be appreciated.

| Band | Locators Activated | + | Locators Worked | + | QSOs | x | Multiplier | = | Band Total |
|---|---|---|---|---|---|---|---|---|---|
| | (10 pts each) | | (10 points each) | | (1 point each) | | | | |
| 6 m | 10 | + | 40 | + | 40 | x | 1 | = | 90 |
| 2 m | 10 | + | 40 | + | 30 | x | 3 | = | 240 |
| 70 cm | 10 | + | 40 | + | 20 | x | 5 | = | 350 |
| etc. | | | | | | | | | |
| Overall Total | | | | | | | | = | 680 |

# WINTER VHF-UHF FIELD DAY 2008: RESULTS

**Contest manager: John Martin VK3KM**

**Here are the results for the inaugural Winter Field Day. Not surprisingly, activity was not at the same level**

Here are the results for the inaugural Winter Field Day. Not surprisingly, activity was not at the same level as the spring and summer contests, but for a first off event at a chilly time of year, it went extremely well. The winners of the five sections were: Doug Friend VK4OE; Michael Coleman VK3AAK; the crew of VK4WIE; the Geelong group VK3UHF; and Leigh Rainbird VK2KRR. Congratulations to these winners and to all who braved the elements to make this first Winter Field Day a success.

| Call | Name | Location | 50 | 144 | 432 | 1296 | 2.4 GHz | 3.4 GHz | 5.7 GHz | 10 GHz | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Section A: Single Operator, 24 Hours** | | | | | | | | | | | |
| VK4OE | Doug Friend | QG61, QG62 | 50 | 330 | 450 | 424 | 630 | - | - | 470 | 2354 |
| VK1DA | Andrew Davis | QF44 | 34 | 465 | 400 | 312 | - | - | - | - | 1211 |
| VK3CT | Damien Wright | QF31 | - | 459 | 270 | 168 | - | - | - | - | 897 |
| VK2AMS | Mark Swannack | QF68 | 40 | 324 | 350 | - | - | - | - | - | 714 |
| VK5AR | Alan Raftery | PF94, PF95 | 36 | 231 | 330 | - | - | - | - | - | 597 |
| VK4HEC | Ewen Cameron | QG62 | - | 228 | 270 | - | - | - | - | - | 498 |
| VK1FOTO | Ian Stevenson | QF44 | - | 171 | 145 | - | - | - | - | - | 316 |
| **Section B: Single Operator, 8 Hours** | | | | | | | | | | | |
| VK3AAK | Michael Coleman | QF21, 22, 31, 32 | - | 402 | 565 | 536 | - | - | - | - | 1503 |
| VK3WRE | Ralph Edgar | QF31 | - | 195 | 270 | 392 | - | - | - | - | 857 |
| VK3HV | George Francis | QF31 | - | 144 | 300 | - | - | - | - | - | 440 |
| VK5AR | Alan Raftery | PF94, PF95 | 31 | 150 | 210 | - | - | - | - | - | 391 |
| VK5OM | Jim Bywaters | QF03 | - | 132 | 220 | - | - | - | - | - | 352 |
| VK4EV | Ron Everingham | QG62 | 32 | 132 | 165 | - | - | - | - | - | 329 |
| VK4DFG | Harry Debnam | QG62 | 32 | 66 | 105 | - | - | - | - | - | 203 |
| VK6ZYX | Mike Beall | OF76, OF86 | 35 | 141 | - | - | - | - | - | - | 176 |
| **Section C: Multi Operator, 24 Hours** | | | | | | | | | | | |
| VK4WIE | (1) | QG61 | 72 | 603 | 495 | 416 | - | - | - | - | 1586 |
| VK3JTM | (2) | QF12 | 39 | 450 | 500 | 576 | - | - | - | - | 1565 |
| VK2BTW | Tamworth RC (3) | QF58 | 21 | 390 | 510 | - | - | - | - | - | 921 |
| **Section D: Multi Operator, 8 Hours** | | | | | | | | | | | |
| VK3UHF | LUMEG (4) | QF22 | - | 402 | 440 | 472 | 320 | - | 210 | 210 | 2054 |
| VK2HRX | (5) | QF46 | - | 321 | 300 | 184 | - | - | - | - | 805 |
| VK3FRC | FAMPARC (6) | QF22 | 37 | 393 | 370 | - | - | - | - | - | 800 |
| VK5SR | SERG (7) | QF02 | - | 168 | - | - | 210 | - | 210 | - | 588 |
| VK1BL | (8) | QF45, QF55 | - | 99 | 170 | - | - | - | - | 210 | 479 |
| VK3WT | (9) | QF22 | - | 207 | 240 | - | - | - | - | - | 447 |
| VK1WJ | (10) | QF44 | 27 | 174 | 225 | - | - | - | - | - | 426 |
| **Section E: Home Station, 24 Hours** | | | | | | | | | | | |
| VK2KRR | Leigh Rainbird | QF34 | 21 | 477 | 430 | 576 | - | - | - | - | 1504 |
| VK3AAK | Michael Coleman | QF21 | - | 309 | 300 | 376 | - | - | - | - | 985 |
| VK4KZR | Rod Preston | QG62 | - | 153 | - | 272 | 210 | - | - | - | 635 |
| VK2EI | Neil Sandford | QF68 | 26 | 264 | 315 | - | - | - | - | - | 605 |
| VK3YLV | David Timms | QF13 | 24 | 111 | 180 | 192 | - | - | - | - | 507 |
| VK5LSB | Simon Brandenburg | PF94 | - | 195 | 265 | - | - | - | - | - | 460 |
| VK3ECH | Rob George | QF23 | - | 288 | 170 | - | - | - | - | - | 458 |
| VK4TJ | John Kirk | QG52 | - | 237 | 180 | - | - | - | - | - | 417 |
| VK2ZTY | Nick Repin | QG61 | 21 | 63 | 105 | 168 | - | - | - | - | 357 |
| VK4FJON | John Cockinos | QG62 | - | 141 | 130 | - | - | - | - | - | 271 |
| VK3BG | Ed Roache | QF24 | - | 249 | - | - | - | - | - | - | 249 |
| VK2CZ | David Burger | QF56 | 22 | 78 | 120 | - | - | - | - | - | 220 |
| VK1PAR | Al Long | QF44 | - | 153 | - | - | - | - | - | - | 153 |
| VK2ZQX | John Watson | QF58 | - | 141 | - | - | - | - | - | - | 141 |

(1) Ron Croucher VK4CRO, Ron Meiring VK4KDD, John Morris VK4MJF, Eric Fittock VK4NEF

(2) Tim Morgan VK3JTM, Dylan Cator VK3JWC, G. Richards VK3FIQ

(3) Tamworth Radio Club Inc - John Hams VK2JH, Cris Perrett VK2FBOZ

(4) Lara UHF - Microwave Experimenters Group: Chas Gnaccarini VK3PY, David Learmonth VK3QM, Ken Jewell VK3NW

(5) Compton Allen VK2HRX, David Sims VK2HSS, Taylor Allen VK2FTEC

(6) Frankston and Mornington Peninsula Amateur Radio Club: Stjepan Nikolic VK3TSN, Andrew Stewart VK3AEJ, David Roitman VK3LDR

(7) South East Radio Group: Chris Skeer VK5MC, Trevor Niven VK5NC, Andrew McKinnis VK5KET, Colin Hutchesson VK5DK

(8) Ted Garnett VK1BL, Owen Duffy VK1OD

(9) Max Chadwick VK3WT, Jack Bramham VK3WWW

(10) Al Long VK1PAR, Waldis Jirgens VK1WJ

# RAOTC 2008 QSO PARTY

Date : Saturday 27th September 2008.

Open to all Amateur Radio operators

Bands: 160, 80, 40, 20, 15, 10, 6, 2 m and 70 cm

Category: Single Operator

Modes: CW, SSB, FM. (Please submit separate logs for separate modes.)

Times: Session One: 0600 – 0800UTC (1600 – 1800 EST)

Session Two: 1000 - 1200 UTC (2000 - 2200 EST)

Calling: On CW "CQ OT". On Phone "CQ Old Timers"

Suggested Calling Frequencies:

CW 1.825, 3.520, 7.020, 14.040 MHz
Phone 1.845, 3.595, 7.090, 14.140, 52.525, 146.500, 439.000 MHz

**Exchange**: RST; serial number starting at 001 and incrementing by one; RAOTC Membership Number. Non-members send "N" in lieu of Membership Number.

**Scoring:** One point per contact. 25 bonus points may be added to the final score for equipment that is between 25 and 49 years old and 50 bonus points may be added to the final score for equipment that is 50 or more years old. Stations may be worked on more than one band, each contact scoring one point.

**Foundation Licensees** will score one point per contact, but may claim a bonus of 15 points for 10 to 15 contacts, 20 points for 16 to 25 contacts, or 30 points for 26 + contacts.

**Award**: A Certificate will be available to the highest RAOTC Member, non-member and Foundation Licensee scorer in each mode (CW, SSB, FM) in each Session separately and for highest scorers in combined Sessions.

**Logs:** Logs must contain the name, postal address, callsign and scores for the station submitting. Please clearly mark logs "Session One", "Session Two" or "Combined", and send separate logs for separate modes (no Mixed Modes).

Send Logs to:
Secretary, RAOTC,
PO Box 107, Mentone, 3194;
or via email to vk3js@inboxnow.com by 10th October, 2008.

Please use email for preference (not forgetting to include postal address of your station) and send your log as soon as possible after the contest.

ar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Blackall Street, Woombye (UBD Map 66 F12)

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(07) 5492 9898.

Email: randwphilp@bigpond.com



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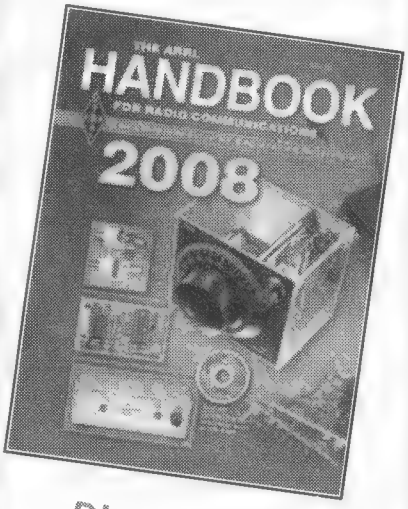


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AMSAT

Paul Paradigm VK2TXT

# Outlining the future

Hello, my name is Paul Paradigm and I am the National Coordinator of AMSAT-Australia and formerly the Coordinator of the OZSATGROUP. As you may be aware, I have taken on the task of writing the monthly AMSAT column in AR from Bill Magnusson VK3JT who has retired from his position in order to devote more time to his other interests.

Before I go on to talk about the various changes in AMSAT-Australia and our plans for the AR column, I would like to take this opportunity to thank Bill for his work in supporting the amateur satellite operators of Australia for the past twenty years or so. Bill's commitment to this column and AMSAT-Australia in general has been outstanding, and his monthly updates in AR will be missed by all. On behalf of AMSAT-Australia I would like to wish Bill all the best in his retirement from AR and with his continued interests in amateur satellites, EME and astronomy.

This year has been quite monumental for the Australia amateur satellite community. In the first few months of the year, the OZSATGROUP continued its growth and has risen to become the major organisation representing active amateur satellite operators in Australia.

## Changes in the wind

By way of a little background, the OZSATGROUP was formed in mid 2005 to fill a need for an open electronic discussion forum for active satellite operators by the creation of an interactive mailing list based on a Yahoo Group.

Within a very short period of time, almost every active amateur satellite operator had joined the OZSATGROUP and the group had begun to morph into a club-like organisation. In late 2005 the OZSATGROUP contacted Graham Ratcliff VK5AGR at AMSAT-Australia with a view to minimize duplication of services when the members of the OZSATGROUP decided to run a monthly HF net. In January of 2006 the OZSATGROUP and AMSAT-Australia joined forces in a manner of speaking with the OZSATGROUP taking the decision to join in with the AMSAT monthly EchoLink net rather than running its own HF net. Those members of the OZSATGROUP who were keen to communicate via HF were encouraged to join with the members of AMSAT-Australia in their unofficial HF get-together on the evening of the EchoLink net.

Throughout 2006 and 2007 the OZSATGROUP membership continued growing and continued its work with AMSAT-Australia to promote amateur satellite operations. The OZSATGROUP began assisting Graham with the running of the EchoLink net and eventually the OZSATGROUP took over the running of the HF get-together, reinstituting it as an official OZSATGROUP and AMSAT net.

Earlier this year, the OZSATGROUP determined that the Sunday afternoon

## AMSAT-Australia

National Co-ordinator:
Paul Paradigm VK2TXT,
email: coordinator@amsat-vk.org
Secretary: Judy Williams VK2TJU,
email secretary@amsat-vk.org
Website: www.amsat-vk.org

### *About AMSAT-Australia*

AMSAT-Australia is a group of Australian amateur radio operators who share a common interest in building, launching and communicating with each other through non-commercial Amateur Radio satellites.

Many of our members also have an interest in other space based communications, including listening to and communicating with the International Space Station, Earth-Moon-Earth (EME), monitoring weather (WX) satellites and other spacecraft.

AMSAT-Australia is the primary point of contact for those interested in becoming involved in amateur radio satellite operations.

If you are interested in learning more about satellite operations or just wish to become a member of AMSAT-Australia, please see our website.

## AMSAT-Australia monthly nets

### *Australian National Satellite net*

The net takes place on the 2nd Tuesday of each month at 8.30 pm eastern time, that is 9.30 Z or 10.30 Z depending on daylight saving.

The AMSAT-VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news.

The format also facilitates other aspects like making 'skeds' and for a general 'off-bird' chat. In addition to the EchoLink conference, the net will also be available via RF on the following repeaters and links.

### *In New South Wales*

| | |
|---|---|
| VK2RMP | Maddens Plains repeater on 146.850 MHz |
| VK2RIS | Saddleback repeater on 146.975 MHz |
| VK2RBT | Mt Boyne Repeater on 146.675 MHz |

### *In Victoria*

| | |
|---|---|
| VK3JED | Preston, Melbourne on 144.296 MHz SSB simplex |
| VK3JED | Preston, Melbourne on 439.175 MHz FM simplex with a 91.5 Hz CTCSS tone. |
| VK3RTL | Laverton, Melbourne, 438.600 MHz FM, - 5 MHz offset |

Operators may join the net via the above repeaters or by connecting to EchoLink on either the AMSAT-NA or VK3JED conferences. The net is also available via IRLP reflector number 9509. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email.

## AMSAT-Australia HF net

Members and interested parties are also reminded of our HF net which is held on the 2nd Sunday of each month. See www.amsat-vk.org for details.

### *Become involved*

Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM 'repeaters in the sky' with just a dual band handheld operating on 2 m and 70 cm. These easy-to-use and popular FM satellites will give hams national communications and handheld access into New Zealand at various times through the day and night.

Should you wish to join AMSAT-Australia, details are available on the web site. Membership is free and you will be made very welcome.

time slot and the exclusive use of EchoLink were contributing to low participation in our joint net, and with the blessing of Graham we changed the monthly net to the current arrangements – see Box. To date, the new Tuesday night net has been a great success taking the participation rate from 4 to 8 members to from 10 to 25! At the time of the change-over to the Tuesday net in February, the OZSATGROUP took over the running of the net to give Graham more time to devote to his family after running the various nets for some twenty five years.

On April 7 this year, after serving as the National Coordinator of AMSAT-Australia from 1983, Graham tendered his resignation to the WIA in his annual report. After discussions with Graham, it was determined that the OZSATGROUP and AMSAT-Australia had two options. First was to approach the WIA to have the OZSATGROUP recognised as the successor to AMSAT-Australia and to let AMSAT-Australia fall by the wayside. The second option was to amalgamate the two entities and to retain AMSAT-Australia and its relationship with the WIA as it stood.

On 8th April AMSAT-Australia contacted the WIA to inform the Institute that the OZSATGROUP and AMSAT-Australia had chosen to amalgamate and we immediately began the process of reorganising our resources and membership. At this time, I took over the role of the National Coordinator of AMSAT-Australia and sought the official Coordinator's position with the WIA. Since then, the WIA Board has confirmed my appointment as the AMSAT Coordinator.

Once again, on behalf of AMSAT-Australia, I must take time out to thank Graham for his outstanding contribution to the amateur satellite community in both Australia and around the world. Graham has been a shining light throughout the history of the AMSAT movement since its inception.

Graham has been one of the most prominent radio amateur operators in our time, having received in 1991an Order of Australia for his service to amateur radio organisations. Graham, it has been a pleasure working with you and I hope to catch up with you on a 'bird' real soon.

## AMSAT-Australia today

Since the formal amalgamation with the OZSATGROUP, we have seen some minor changes to the organisation of AMSAT-Australia in order to formally integrate the OZSATGROUP forum and its members. In the past, membership to AMSAT-Australia was conveyed by joining the AMSAT-Australia mailing list. As of July 2008, the only way to become a member of AMSAT-Australia is by signing up to the AMSAT-VK forum, which is administered via a Yahoo Group, mirroring the prior OZSATGROUP arrangements. Membership to AMSAT-Australia continues to be free of charge.

The former members of the old mailing list were invited to sign-up to the new AMSAT-VK Group, and the earlier list was phased out over three months or so.

Membership to AMSAT-Australia is open to all who are interested in amateur satellite and space operations. Licensed amateur radio operators need only supply their first name, callsign and email address at the time they register with the AMSAT-VK Group.

Those who are not licensed need to also supply their full name and address in addition to their email address. As soon as the registration has been completed, you will automatically become a member of AMSAT-Australia.

As far as the day-to-day operation of AMSAT-Australia is concerned, it is almost completely run via the internet through the AMSAT-VK Group. All members have access to our mailing list and forum, in addition to our file library, picture gallery, a shared calendar and access to our membership and other databases. When AMSAT-Australia needs to consult with our members, we conduct polls via the AMSAT-VK Group website.

At this point I should introduce Ms Judy Williams VK2TJU, the secretary of AMSAT-Australia. Judy is responsible for the AMSAT-Australia paperwork and mail. Judy also manages and moderates the AMSAT-VK Group website. If you ever have any questions about AMSAT-VK, please feel free to contact Jude.

Another significant change has been to our main public website. Our site, which can be accessed at www.amsat-vk.org, has been completely rewritten and updated. We look forward to adding new features to the site in the coming months, including the introduction of the Australian Satellite FAQ, which is currently under development.

## Moving forward

With the reorganisation of AMSAT-Australia and the retirement of Bill Magnusson, I would like to take this opportunity to rethink the monthly AMSAT column in Amateur Radio magazine.

While I will continue to provide updates on pertinent news, and to publish a six monthly satellite update, I would like to begin to use the column to publish other material of interest to satellite and space enthusiasts. This may be in the form of a tutorial on using a particular software package, on how to get started on a particular bird or mode, or any other topic suggested by AR readers or the members of AMSAT Australia.

AMSAT-Australia is driven by the wants and needs of our membership and I would like to take the same attitude with the AR column. I would ask that if you have any ideas or suggestions for the column, please send me an email to coordinator@amsat-vk.org

All the best, 73 and catch you on one of the birds soon.

ar

# News Updates

### *DO-64 now available to hams*

The amateur-band linear transponder on board the Delfi-C3 satellite, now known as DO-64, has been activated. Here are details.

CW beacon: 145.870 MHz

Linear transponder downlink passband: 145.880 - 145.920 MHz

Linear transponder uplink passband: 435.570 - 435.530 MHz

### *FO-29 re-emerges*

After being off the air over Australia and New Zealand for many months, FO-29 is once again available for operators down-under and around the world. The bird is active for SSB voice subject to solar power availability.

# DX - News & Views

**John Bazley VK4OQ,**
P.O. Box 7665, Toowomba Mail Centre, QLD 4352. E-Mail: john.bazley@bigpond.com

Although activity on the HF bands is still quite low, the 'pundits' tell us that the Sunspot Cycle is still on track with an expected peak in 2012. It is hard to believe that the peak is only four years away. The current minimum seems to have gone on for much longer than that!

In spite of this minimum, it is surprising the long haul DX that can be worked relatively easily. For example on 20 metres the other day, on a comparatively dead band, at 0520 signals from C9 and 3DA0 were a genuine 599 on the long path. That is a path length of nearly 29,000 km – that is DX in anyone's book!!!

So what DX news do we have this month?

First a note from Bernie W3UR:

"Recently DXers in the US have been reporting receipt of the VP6DX QSLs. My neighbour and I have also received ours. Let me start by saying I did make a donation after the DXpedition was over.

The 36-page booklet QSL was definitely worth the wait. The booklet QSL shows multiple photos along with captions of the DXpedition. It also tastefully recognizes the major sponsoring organizations, several corporate sponsors and the early major individual sponsors.

A big thank you to each of the sponsors, as this operation would not have been possible without their support!

The VP6DX Ducie Island team not only set many DXpedition records, but more important some very good DXpedition standards. Was it a perfect operation? No, but it has been judged one of the best by quite a number of DXers. This group does have plans for future operations and will no doubt set the bar higher. The QSL booklet is well worth the wait."

Good to hear that the ARRL DX Bulletin reports that 2008 operations from 5X4X have been approved for DXCC credit.

Mike KM9D, and his girlfriend Jan KF4TUG, have not yet begun their next sailing season.

They plan to begin this junket after the RSGB IOTA Contest and expect their first Amateur Radio stop to be Temotu Province (H40), a separate DXCC entity from the Solomon Islands (H44). Mike is hoping to be able to operate from Vanikolo Island (OC-163), Temotu Province. This is one of the rarer IOTA groups within the province.

Willi DJ7RJ has booked his August 26th flight via Los Angeles LAX to Samoa, 5W. He and Ulli DL2AH will also go to ZK3, then back to Samoa, and they are looking at another stop after that, maybe the Marquesas (FO/M) or Wallis and Futuna (FW).

Ulli would like to visit KH8 again, where he was a few years ago. Willi's flight back to Germany is October 27th but he plans to spend a couple ofdays in California during his trip homeward. On the 5W plans, everything is coming together.

They are in touch with the shipping company in Apia and two ships leave within days of their arrival on Samoa. They have a good chance of getting passage on one of the ships. They hope to arrive on Tokelau September second or fifth.

They have to stay at least three weeks on Nukunonu before going back to Apia, putting them back in Apia at the end of September. Then they will decide where to go next. QSL via their call book addresses. Willi's last trip to Tokelau was in September 2003.

Svalbard is going to be a busy place; JW5X will be there on September 25-29 for the Scandinavian Activity Contest, phone. Before and after that, operators LA7XK, LA6VM and LA9DL will be on with the call signs JW6VM, JW7XK and JW9DL on CW, SSB, RTTY and BPSK. QSL via the Norwegian bureau or direct to their published addresses.

JW7WCA will be on 160-10 m SSB and some CW September 19-26 from Svalbard. Operator LA7WCA will be joined by LA8BCA using the JW8BCA callsign and by JW/LB9UE.

VP8LP goes to Ascension Island August 15th or so, staying until September 14th. He has the ZD8LP callsign. Bob will only have a vertical but plans to be very active on 40 through 10 m, following the best propagation. QSL direct only, to his VP8LP home call.

Martyn G3RFX, also known as ZB2FX and 8P9FX, has started getting reports of QSOs with ZB2F including some listings of him as the QSL manager. He is convinced ZB2F is a pirate station, and certainly he has never been the QSL manager for this one or anything like it. But, he says he will, himself, be back on the air as ZB2FX, September 5-15.

Andrew 8Q7AK, home call G7COD, will be operational from Kaafu Atoll, Republic of Maldives, October 12 at 0730Z until October 25 at 0800Z. He will have an IC7000 to a Carolina Windom "CWS 160 Special" antenna from 38-foot-high coconut palms, and a 9-metre-long homebrew vertical. He will be on 40 through 12 m, SSB and CW. Andrew expects to be on every day from 0730-0830 Z, 0900-1030, 1300-1500 and 1730-1745. Look for him on 7063, 14147, 18133, 21253 and 24953 SSB, 7003, 10103, 14003, 18073, 21003 and 24893 CW. QSL direct to G7COD with SAE.

T32CXX, Eastern Kiribati will be the CQWW SSB callsign for operators NY0V and K0DAS, Tom and Rod, October 23-28 inclusive operating dates. T32CXX is Tom's call and T32DAS will be Rod's call. They plan to be multi-single during the contest. QSL T32CXX via W0CXX and T32DAS via K0DAS. W0CXX being the Collins Amateur Radio Club call, I wonder if they will be using Collins equipment? KWM2-As and 30L1s perhaps.

According to news from Mehdi F5PFP (FT5ZH), there is now a possibility for easy access to FT5X, FT5W, and FT5Z. 'Marion Dufresne', a ship well known from several DXpeditions, is now open to be booked by ten to twenty tourists. The ship will stop at Crozet (FT5W), Kerguelen (FT5X) and Amsterdam (FT5Z) for three, or up to eight, days at each location. Operators from CEPT countries will get their permission easily

# Spotlight on SWLing

Robin L. Harwood VK7RH

The Olympic Games in Beijing commenced and as expected the Chinese really celebrated the honour of staging the 29th Olympiad, going to great lengths to maximise publicity and prestige. One thing that has eluded them is the smog, with drastic efforts made to try and curtail it and this has had little or no effect. As expected the Opening Ceremony was extensively covered over short wave, especially via the numerous Chinese outlets. Other broadcasters also covered it live but I mainly concentrated on watching on TV. Since the last Olympics in Athens, we now have digital TV with much clearer vision. I personally watched the Opening Ceremony to almost 2 am and retreated to bed.

In the days prior to the Olympics there was no let up with the Firedrake jammers and this continued unabated. As you may remember, the Internet was not freely available within the PRC to certain sites deemed to be against the Chinese national interest. This naturally led to the question – if the Net is easily blocked, why do many international stations increasingly stream their programming? The number of listeners online at any time to a particular stream is considerably less than via radio, whether it is domestically or via short wave. A plus of course for streaming is the ability to download these files for later playback via your computer or on Ipod. For example I am at present listening to a very interesting discussion from a remote receiver near Berlin in French on Internet censorship. True, the audio quality is far superior to a signal over HF.

Radio Singapore International did close down at 1400 on July 31st and two hours later the short wave relays of the domestic networks were also finally switched off. This has freed frequencies in the 49 metre allocation but other stations quickly filled the vacant channels or were audible after being buried by RSI. Even the BBC senders at Kranji, which is close to where the RSI senders were located, seem much weaker here.

The VOA made a surprising decision to stop broadcasts in Russian on the 26th of July. It has been on in that language since 1942. The International Broadcasting Bureau (IBB), which supervises all US Government broadcasting, upset some in the Congress over the decision. The semi-clandestine Radio Liberty/Radio Free Europe took over the frequencies and some times of the former Russian VOA programming. This has led to questions being raised about the future of the VOA and the incoming administration, due to be elected on the first Tuesday in November, will probably make a decision next year. Meanwhile you can hear the VOA in English to Oceania at 2200 on 9415 kHz.

Radio Romania International recently inaugurated new senders for their short wave transmissions and they definitely have improved both the signal strength and clarity of their audio, compared to the tired old transmitters that dated back to the Cold War era. It is interesting that Poland no longer uses its own senders and now buys airtime over transmitters in Germany, and DW in Bonn also no longer broadcasts from German sites but buys airtime from a variety of senders in the UK, Canada, French Guyana and the Commonwealth of Independent States (CIS). DW still owns and operates the Kigali, Rwanda senders and at Trincomallee in Sri Lanka.

Well that is all for this month. Do not forget you can email any news or comments to vk7rh@wia.org.au.

73 from Robin L. Harwood

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## DX - News & Views continues

from the licence administration "TAAF" and will use FT5X/, FT5W/, FT5Z/home call. With a proposed cost of 6,500 Euro (nearly A$ 11,000), it is not a cheap trip but the outstanding helicopter flight to Amsterdam and Kerguelen is included. The next voyages from Reunion will take place November 3rd through December 1st 2008 and December 3rd through 31st 2008. Time schedules for 2009 will be published soon.

A large group from Belgium, South Africa and Australia have announced plans to operate as C91FC from Mozambique between April 8th and April 17th 2009 (I hope they will not forget the Long Path Openings to VK!). Operators include ON4AEO, ON7BK, ON4CJK, ZS6GC, ZS5AYC, ZR6APT, ZS6IMO, VK4AHT, VK4EMH, and possibly others. Sometime in January 2009 they will have a Web page up at www.c91fc.be. QSL this operation via ON4CJK.

A group of YL operators will be active from the Falkland Islands (SA-002) from the 17th to the 31st January 2009. They will be using VP8YLx callsigns, with the third character of the suffix assigned to each lady at the start of the event. Further information, in due course, will be available at http://www.radioclubs.net/aa_vp8yl/

Twelve members of the Tennessee Valley DX Association (http://www.tvdxa.com) will operate as W4PL from Hatteras Island (NA-067) from 27th September to 4th October. They plan to be active from 80 to 10 metres SSB and CW (with some PSK and RTTY), and on 6 metres SSB and CW. QSL via K4KWK, either direct or via the bureau.

We hear that Lee K5UN is heading back to Martinique for this year's CQ World Wide CW DX Contest. He will be there from November 24th to December 2nd and using the special call TO5X. During the contest he will be SOAB. QSL via K5UN.

Happy DXing.

Special thanks to the authors of The Daily DX (W3UR), 425 DX News (I1JQJ) and QRZ.DX for information appearing in this month's DX News & Views. For interested readers you can obtain from W3UR a free two week trial of The Daily DX from www.dailydx.com /order.htm

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# VHF/UHF – An Expanding World

**David Smith VK3HZ** vk3hz@wia.org.au

# Weak Signal

**David Smith - VK3HZ**

Mid-June showed good conditions in the south as a high-pressure cell crossed. Barry VK3BJM reports:

"June 14/15 weekend was interesting on 2 m plus. Saturday am was flat, peak being a 53 contact with Chris VK2DO/m (in his driveway) and a 53/52 exchange with Phil VK5AKK at 2314 Z. I monitored the VK5VF 2 m beacon that pm and, while audible, it was not hair-partingly loud.

Unlike Sunday morning! At 2210 Z, VK5VF 2 m was 10 over 9. The VK5VF 70 cm beacon was also heard. Swinging to Mt Gambier, VK5RSE 23 cm beacon was 56 and touched 59. Back to Adelaide, I worked Brian VK5BC (56), Jeff VK5GF (53), Phil VK5AKK (57), and Bill VK5ACY (54) on 2m. Brian VK5BC was also worked on 70 cm at 41-51. No joy working Phil on 23 cm. At 2250, I swung to the northeast for the last 10 minutes of the AE hour. After working VK1BG on 2 m and 23 cm, I went west as I could hear Peter VK5ZLX through the back of the 2m array. Reports of 59++ were exchanged on 2 m, followed by 23 cm (52 both ways) and 70 cm. Working Peter on 23 cm for the first time from home provided a new grid locator for me on that band, thanks, Peter. An attempt was also made with VK5BC on 23 cm, but nothing truly readable was heard.

"VK7 was also coming in well, and at 0014 Z I worked Joe VK7JG for more than 10 minutes, with reports again at 59+. Also worked John VK7CEJ for the first time (55) at 0028 Z. At 0042 Z I heard Norm VK3DUT through the back of array at 52; with array pointed at Johnsonville, Norm was 58.

"I kept the array pointed at VK5 for the rest of the day; the Mt Lofty beacon did not drop below 57 until Monday morning, after 2300 Z. Worked Phil VK5AKK at 1300 Z Sunday night and again at 2151 Z Monday morning - Phil was 59+10 both times, but 23 cm continues to elude us. We exchanged 52/53 reports on 70 cm at 2159 Z.

I did not note all the unfamiliar callsigns heard during the enhancement, but I heard many working Phil - his logbook must be much fuller today!"

## 24 GHz World Record

In Australia, there is increasing interest in operation on the higher microwave bands. 10 GHz ops have been going on for many years, but recently, a number of stations have acquired 24 GHz capability and discovered that this is quite different from 10 GHz with path losses sharply increasing with the amount of moisture in the air. Best results seem to be well before sunset (after which humidity rises rapidly), and in very dry conditions - e.g.in a cold-climate winter with the moisture frozen out!

With this in mind, it is interesting to hear of world record contacts in France in their mid-summer. On June 23, Marc F6DWG/P near Picardie in the north and Guy F2CT/P in the south-central had a remarkable 637 km QSO late in the night. This exceeded the previous tropo record of 544 km by some margin. Christophe ON1CFX in Belgium heard Guy F2CT/P on 10 GHz at 805 km for 45 minutes, but nothing on 24 GHz. Next day, Guy worked Willi LX1DB in Luxembourg on 24 GHz via rainscatter, resetting the record to 710 km.

By comparison, the VK 24 GHz record between VK3ZQB/P and VK3XPD/P currently stands at 230 km.

## VK2DO mobile ops

With a change of work vehicle, Chris VK2DO redesigned his mobile 2 m DX setup. His old twincab ute had a 2 m Yagi mounted low above the canopy. Pressures from offspring, who (understandably) refused to be seen in the vehicle, meant a more stealthy system.

Chris built a Yagi using the supporting cross spar inside the fibreglass canopy as the boom. His route to work in Canberra (generally NW) has the Yagi usually pointing right for Melbourne and Sydney (I gather the F/B ratio is not great). Chris reports on operations:

"Last Saturday, on my way to work, I listened to the 2 m aircraft operations on 144.200 MHz when Ian VK1BG took Mark VK2EMA up to 70 cm. I flicked up to 432.150 and of course, through my 4-element beam that is a good match on 432, I could hear Ian. As I changed direction, I was also copying Mark at about S5. During one handover, I called Mark and he gave me 5x7. (The IC-7000 uses the same connector on 2 & 70 cm so without additional bricks in circuit, you are automatically able to work on 70 cm if the 2 m antenna will take power). The new antenna, in the canopy support, is four elements with I suppose a beta match of a kind, but the radiation efficiency is an odd one surely?

"Do not rush out and start using a 2 m beam on 70 cm. It was just one of those astonishing contacts that might not be readily repeated. On 70 cm, everything in the driven element of the Yagi is just an odd number of half or quarter waves, but who knows what the radiation pattern truly is, or whether there is really any gain to speak of. Also, although the feed line is not long, 2.5 m of RG214 probably starts to hide an odd match. 350 km on 70 cm is not that amazing, especially with Mark running EME type antenna gain. But with just my 35 watts it was a lot of fun to see it take place."

## Meteor Scatter

While Rex VK7MO normally reports on digital mode MS contacts, there has been a small revival of interest in SSB MS contacts, driven by an apparent increase in large meteors recently. On July 27, Ron VK4KDD reports:

"I was alert for possible SSB MS contacts, because I saw VK3SO reporting on the VK Logger a 15 sec burn on the digital stuff more than an hour earlier. Just seconds before the opening, I heard an indication and reported on the logger that I was hearing "weak signals". I started to call and … woops … heard the world coming back - VK2's, VK3's, so many letters and voices at the other end, that I got no single callsign. There were at least a dozen stations peaking S9 and stronger. I heard them all replying, but that does not make it any easier. No reports were exchanged.

Mike VK3AAK was also trying hard to make an SSB MS contact. A few weeks later, he succeeded:

"After weeks of teasing, the delta Aquarids meteor showers produced an SSB MS contact between VK2 and VK3. During the regular Aircraft Net on Sunday 16th August at 2249 Z, Steve VK2ZT's CQ was heard in Melbourne. Several stations responded with Steve hearing my report of 5x7. He immediately confirmed and returned a 5x7. The contact was less than ten seconds, but long enough for Steve to also hear Peter VK3KAI, but I believe it died before exchanges were completed.

This contact comes after several weeks of one way signals including one very strong burst from Ron VK4KDD being heard in VK1,2 & 3; Steve VK2ZT being heard in Melbourne, and I in Sydney. These events have all been observed between 2200 Z and 2300 Z during the Aircraft Net on 144.200, obviously coinciding with the high activity level on 2 metres at this time.

## Beacons

Mark VK2XOF reports that the VK2 beacons are being resurrected. Work is progressing on the 2 m and 70 cm beacons. The 23 cm beacon on 1296.420 MHz is operational at the Dural VK2WI QTH. Power is now 20 W and the signal is generated from a cavity oscillator locked to a 0.1 ppm oven. It has been running since mid July and Mark would appreciate any signal reports. Ian VK1BG has already reported hearing it consistently in Canberra at S1, lifting to S4 with aircraft enhancement – the first time Ian has heard the 23 cm beacon from Sydney.

Doug VK4OE reports VK4RBB beacons are back on air on all of their licensed frequencies: 432.440 MHz; 1296.440 MHz; 2403.440 MHz, and 10368.440 MHz. They should all be within 100 Hz of frequency after a soak test. Doug would appreciate any reception reports from SE Queensland and further afield.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

## Digital DX Modes

**Rex Moncur – VK7MO**

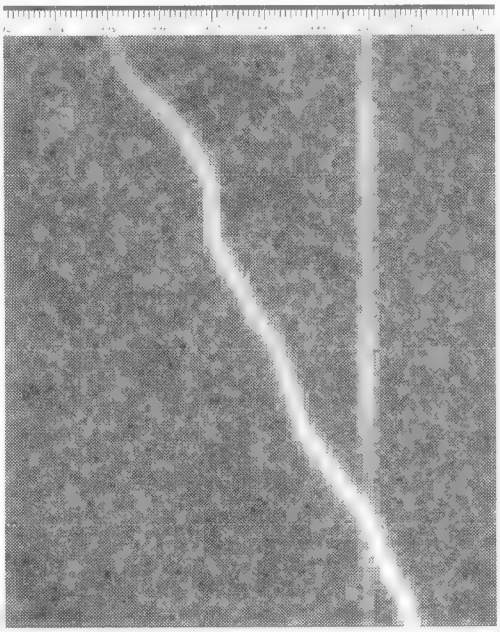
Welcome to these new operators who are joining in or listening in to the 144.230 MHz FSK activity sessions – Rex VK3OF, Nigel VK3KSD, Owen VK1OD, Glenn VK4BG and John VK7CEJ. Rex completed his first FSK441 contact with VK4WS and Owen his first with VK4JMC.

After GippsTech presentations on locking rigs to GPS and the use of the ADS-B virtual radar system for aircraft tracking, Rhett VK3VHF has his IC-910H GPS locked and has been monitoring the Doppler shift from aircraft on two metres as shown in the Spectrum Lab waterfall display below. Also shown is a diagram of the aircraft tracks at the same time from the ADS-B system. The aircraft producing the reflected signal left Launceston (JST748) and headed roughly north before crossing the direct line between the transmitting and receiving stations, heading for Sydney. The Spectrum Lab waterfall display shows the direct troposcatter signal as a straight line at 1000 Hz with the aircraft reflected signal starting high in frequency at 1001 Hz crossing the tropo-scatter frequency at about the same time as it was seen to cross the path between the transmitting and receiving stations and then falling in frequency to 995 Hz as it moves further away from the direct path.

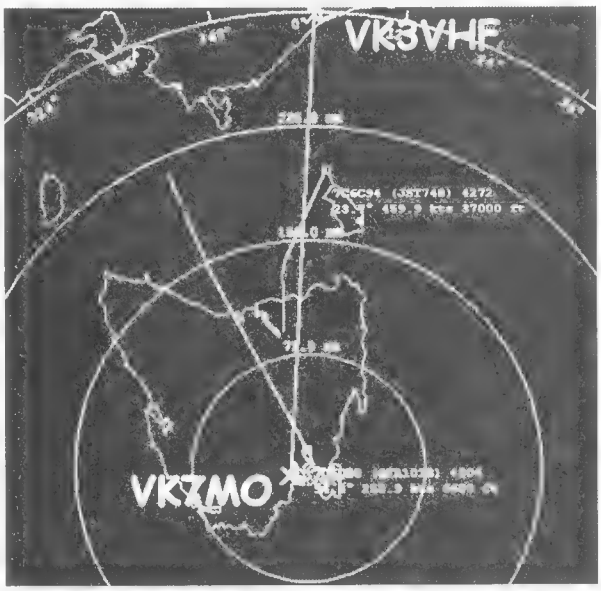
On 26 July 2008, Rex VK7MO, assisted by Eric VK7TAS as dish driver, broke the 13 cm (2300 MHz) Earth Moon Earth World distance record, twice!!!.

Rex was running 120 watts to a 2.3 metre dish. The record was held by Charlie VK3NX and Peter G3LTF at 16970 km. Eric's job was to keep the 2.3 metre dish antenna directed at the moon within less than half a degree. A sked had been set up with Howard G4CCH and shortly after the moon cleared the trees at Howard's QTH, weak digital signals were copied at 25 dB below the noise. At 13 cm or 2300 MHz, frequency drift is a major issue and Howard's signals were difficult to copy due to drift of 60 to 80 Hz each transmission. Nevertheless, after a few missed decodes, a QSO was completed for a new 13 cm EME World record of 17385 km. As the moon cleared the trees in England, signals improved to the point that they were audible and a CW QSO was also completed. Peter G3LTF, at 17491 km, then called on CW and the World record was extended a second time in less than half an hour by a further 106 km.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.



Spectrum Lab waterfall display showing Doppler Shifted frequency from aircraft as the slanted line and the direct troposcatter signal as the straight line at 1000 Hz.




ADS-B Virtual Radar view of aircraft JST748 which produced the reflections shown on the waterfall. The line between the Xs shows the direct path between the stations.

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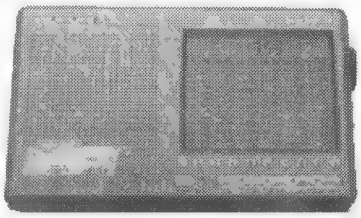

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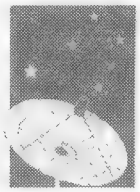

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Who knows? The boat anchor gathering dust at the back of the shack might be someone else's idea of a longed-for treasure. Test it out with a HAMAD.

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HP TRACKING GENERATOR Model 8444A, preferably with Option 059 or 058. I would consider a unit without either option. Instrument must be in good working condition. Please phone Garth VK3BBK (QTHR) on 03 5968 5408 daytime or evening. Email dylfrd@yahoo.com.au but would prefer phonecall. (9)

EARLY YAESU HF transceiver FTDX-401 OR FT-DX560. These were in use around the late 1960s to 70s. May be working or have a fault - but otherwise complete and mechanically sound. Preferably from a non smoking environment. Happy to discuss a suitable remuneration, external appearance to be reasonable considering age. Contact: Ian VK3XI QTHR email ikeenan@bigpond.com.au or Ph (03) 9580 6627 (9)

I am looking for a GENERAL RADIO GR 1931A modulation monitor. Thanks. John Eggington VK3EGG. Mob: 0409 234 672 Email: vk3egg@optusnet.com.au Mobile: 0409 234 672 (9)

My cousin in Latvia, YL2GRE, needs a QUARTZ FREQUENCY STABILIZER to repair his home made transceiver. Where do I go to buy one? Jack Ziedars 11/30 Thomas Street, Doncaster East, Vic 3109. Tel: 03 9841 9373 jekabs@techinfo.com.au (9)

I am looking for a suitable CW filter for the YAESU FT-301 transceiver. It is a Yaesu type XF-90C crystal filter and may have been used in other Yaesu transceivers. Or any suitable CW crystal filter with an input/output impedance of 500 Ohms and 9MHz centre frequency. Roderick Wall VK3BKO. Phone: 0413074386 or email: vk3bko@wia.org.au (8)

Desperately seeking WOBBULATOR for IF alignment, needs to cover 455 and 500 kHz centre frequencies. Clem Jarvis VK3CYD, PO Box 285, Newborough, 3825. (03)5126 2064 clem@dcsi.net.au (8)

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http://www.wia.org.au

### News Bulletin Schedule

Subject to change.
See www.wia.org.au and follow National News prompts.
Contact nationalnews@wia.org.au
National VK1WIA news is distributed to all states.

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***Chairman of the regional committee is in bold***

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Wayne Cockburn VK8ZAA

## Broadcast details

**VK1** VK1WIA: Sunday 0900 local on the Mt Ginini repeaters 146.950 and 438.050 MHz. The UHF repeater requires 123 Hz access tone and is linked to the Goulburn repeater.

**VK2** VK2WI: Sunday 1000 and 1930 local, on 1.845, 3.595, 7.146, 10.125, 14.170, 28.320, 52.525, 145.6000, 147,000, 438.525 and 1273.500 MHz. Also 5.425 MHz USB in the morning..
Plus provincial relays both sessions and country relays in the morning via local repeaters. VK1WIA news is included in the morning.

**VK3** VK1WIA: Sunday 10:30 am and 8 pm Local Time. Amateur Radio Victoria VK3BWI B/cast Network: 3.615, 7.158, 10.130,147.250 VK3RMM Mt Macedon, 146.700 VK3RML Mt Dandenong, 147.225 VK3RWG Mt Baw Baw, 438.075 VK3RMU Mt St Leonard.

**VK4** VK1WIA: Sunday 0900 local via HF and major VHF/UHF repeaters.

**VK5** VK5WI: Sunday 0900 local, on 1.843, 3.550, 7.140, 28.470, 53.100 AM, 146.900 (SE), 146.925 (CN), 147.000 and 439.975

**VK6** VK6WIA: Sunday 0900 local, on 1.865, 3.582, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120, 50.150, 146.700 and 438.525 MHz. Country relays on 3.582 MHz and major repeaters.
Repeated Sunday, 1900 local, on 1.865, 3.565, 146.700 and 438.525 MHz. Country relays on major repeaters.
Also in 'Realaudio' format from the VK6WIA website.

**VK7** VK7WI: Sunday 0900 local, on 1.840 AM and 3.570 MHz and on major repeaters.
VK7 regional news follows at 0930 local, on 7.090 and 14.130 MHZ, and on major repeaters.

**VK8** Sunday 0900 local, on 3.555, 7.050, 10.130 and 146.900 MHz.

**Note that many clubs broadcast the WIA News via local VHF and UHF repeaters. Check the News section of the WIA website.**

# VK3XPD gets serious about 10 GHz

Alan Devlin VK3XPD and
Peter Freeman VK3KAI

**Are you interested in microwave operations, especially on 10 GHz? The pictures show the latest effort by Alan VK3XPD, well known by most interested in amateur microwave activity in Australia.**

The dish elevated to 45 degrees, pointing west.

Pointing north, with the Surrey Hills Radio Terminal again visible.

Alan has a GPS Locked, 10 GHz Transverter which is tower mounted with full azimuth and elevation control which can be operated from the radio shack.

Alan is currently running about 4-5 watts but has something bigger to install when time permits.

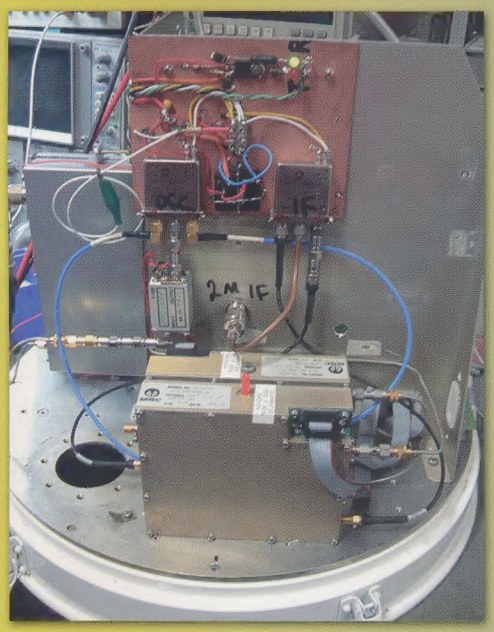
Of course, Alan reports:

*I am looking forward to working ANYONE!*

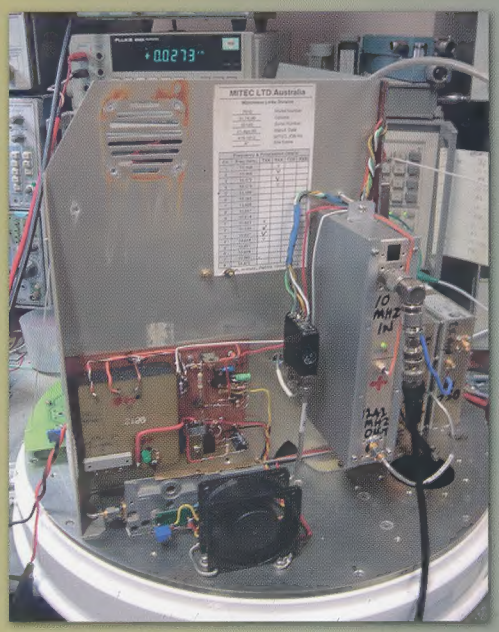
*The much modified MITEC hardware sits atop a tower section attached to my garage at about 7 metres above ground.*

*The Pan Tilt operates on 115 V ac and the Transverter has a 24 Volts dc supply regulated down.*

*All Power cabling is supplied from a garage mounted controller. The shack controller is fed power from the garage controller. It has circuitry for AZ/EL drive and indication together with status indicators for the transverter and the GPS locking. The only other cabling from the Shack is the 432 MHz IF and the GPS Locked 10 MHz reference signal.*



Some of the internal modules: MITEC RX & TX modules with oscillator and IF switching.



Another view of internal modules: a modified four (4) Watt PA from a Ku uplink unit (behind the fan) and a SM6VFZ oscillator with GPS Locking.

18/8/08 9:52:05 AM

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